

Hitachi Ops Center Automator

11.0.4

User Guide

Ops Center Automator is a software solution that provides the necessary tools to automate and simplify the end-to-end processes, such as storage provisioning, for storage and data center administrators. This manual describes how to use Hitachi Ops Center Automator.

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Preface

This manual provides information about Hitachi Ops Center Automator.

Product version

This document revision applies to Hitachi Ops Center Automator v11.0.4-00 or later.

Release notes

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

Conventions for storage capacity values

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

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

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

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

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

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Thank you!

Chapter 1: Getting started with Ops Center Automator

Before you get started, familiarize yourself with the basic features and functionality.

About Ops Center Automator

As a storage administrator, you spend a lot of time performing repetitive manual tasks. These tasks are not only time-consuming, but they also can be error-prone. Considering the changing landscape of data center function, you must spend your time on mission-critical tasks that assure the smooth functioning of the data center. To fulfill the demand of data center tasks, you need software that can automate the common infrastructure needs and processes. With Ops Center Automator, you can easily automate time-consuming manual tasks and streamline workflows, such as provisioning, that otherwise take hours to complete.

Ops Center Automator is a software solution that has the necessary tools to automate and simplify the end-to-end processes, such as storage provisioning, for storage and data center administrators. The building blocks of the product are prepackaged automation templates known as service templates.

Ops Center Automator integrates with existing other management software applications to automate common infrastructure management tasks by utilizing your existing infrastructure services.

Some of the supported features of Ops Center Automator are:

- Preconfigured service templates that help you customize automation services.
- Automation services for provisioning of volumes.
- Role-based access to defined services.
- Performance-based pool selection that chooses the best performance pools from infrastructure groups and gives pool information to each task for specifying the Volume Usage details.
- Common service management attributes that can be assigned and shared across all automation services.
- A customizable service catalog that users can create to address specific data needs.
- A RESTful API.

Before getting started with Ops Center Automator, understand the following key concepts:

Service templates

A service template is a deployment blueprint for the application-based storage capacity provisioning process. It is designed to encapsulate configuration settings, instructions, and tasks needed to automate requests such as provisioning. The default configuration settings and tasks that are used in designing service templates are based on best practices and real-world data center scenarios including resource allocation, optimization, and configuration. When you install Ops Center Automator, service templates are automatically installed and are preconfigured for use.

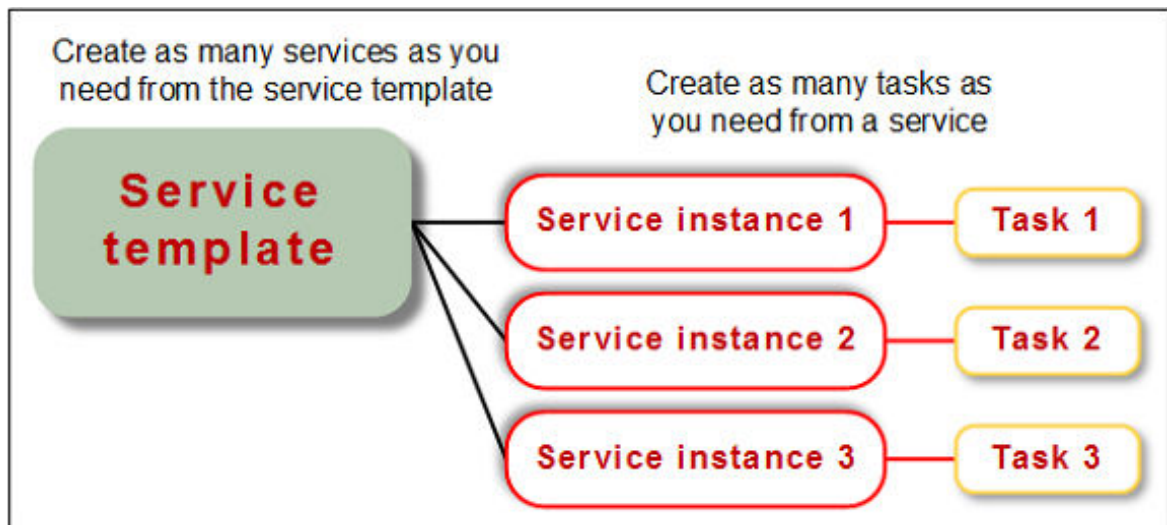
Services

A service is an instance of a service template that is configured to work with your needs. When you create a new service, you are creating a copy of the selected template and reusing the configuration settings, tasks, and processes defined in the template. A service template is used as the starting point for creating a new service and a service is the starting point for automating storage provisioning requests. You can create as many instances of a service template as required. You can classify services by usage and type categories and display them in a hierarchical structure. Because Ops Center Automator enables you to tag a service with multiple categories, you can filter services according to purpose, such as for displaying services by workload or business unit.

Tasks

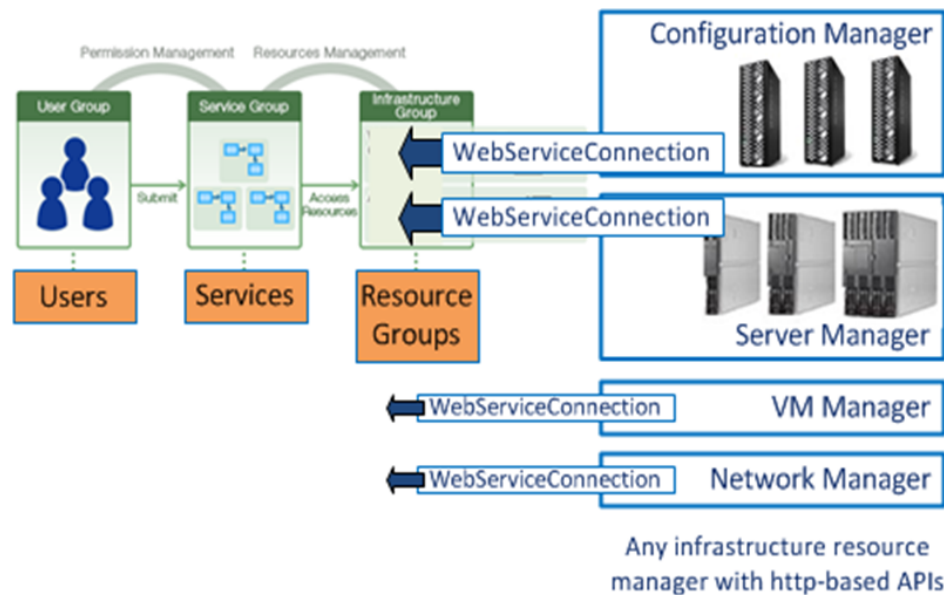
A task is an instance of a service. When you submit a service, Ops Center Automator creates a corresponding task that can be scheduled to run immediately or based on a schedule. A task can also be suspended, resumed, stopped, and archived based on your needs.

The following figure shows the relationship between templates, services, and tasks.



Infrastructure groups

An infrastructure group organizes storage resources and enables you to associate them with services and grant access to users. Resource groups that contain pools for storage are assigned to infrastructure groups. The infrastructure groups are associated with service groups. The services in a service group can access the resources in the associated infrastructure group.



Service groups

A service group is a collection of services. A service group is associated with a user group and a role is assigned to give the users permission to use the services in the service group. In addition, the service group is associated with an infrastructure group, to enable the services in the service group to use resources in the Infrastructure groups.

User groups

A user group is a set of users with a defined level of access. User groups are associated with service groups to enable users to access the services in the service group.

User responsibilities

In addition to the system administrator and security administrator, Ops Center Automator gives two global user roles for storage administrators: service administrator and service user.

Security administrator

If you log on with Hitachi Ops Center, the security administrator is responsible for user management such as creating, editing, deleting users and user groups.

System administrator

After installing Ops Center Automator, the system administrator completes the initial setup tasks of creating pools, discovering storage systems, registering hosts, creating users and defining user permissions. When the initial setup is complete, the service administrator and service user take over management of the system.

Service administrator

The service administrator is an administrator who has advanced knowledge of data center functions and is responsible for managing end-to-end IT infrastructure including prioritizing and routing service requests to service users, attending to all critical service requests, and meeting Service Level Objectives (SLO). In Ops Center Automator, this type of storage administrator is responsible for creating and managing all automation services and delegating the responsibility of running services to service users as needed.

Service user

The service user is an administrator who is responsible for the management of automation requests, which consists of submitting and verifying the completion of automation services and monitoring all pending and scheduled tasks.

User Actions

The actions that users can complete after the initial setup depend on the Ops Center Automator user role as follows.

Users	Available Actions	Ops Center Automator User Roles
System administrators	Modify shared property settings. Create users and user groups. Create service groups and associate services with the groups. Create infrastructure groups and add storage resources with the groups. Associate infrastructure groups with service groups to enable the services in the service groups to use resources in the infrastructure groups.	Admin
Service administrators Service users	Create requests. Stop tasks. Suspend schedules. Cancel schedules. Resume schedules. Resubmit tasks.	Admin, Develop, Modify, or Submit

Users	Available Actions	Ops Center Automator User Roles
Service administrators	Archive tasks. Create services. Edit services.	Admin, Develop, or Modify
Service administrators	Service Builder actions: Create, modify, build, and release templates and plug-ins.	Admin or Develop

Automation scenarios

The following common scenarios might apply to your automation needs.

Scenario 1: Provisioning of storage resources

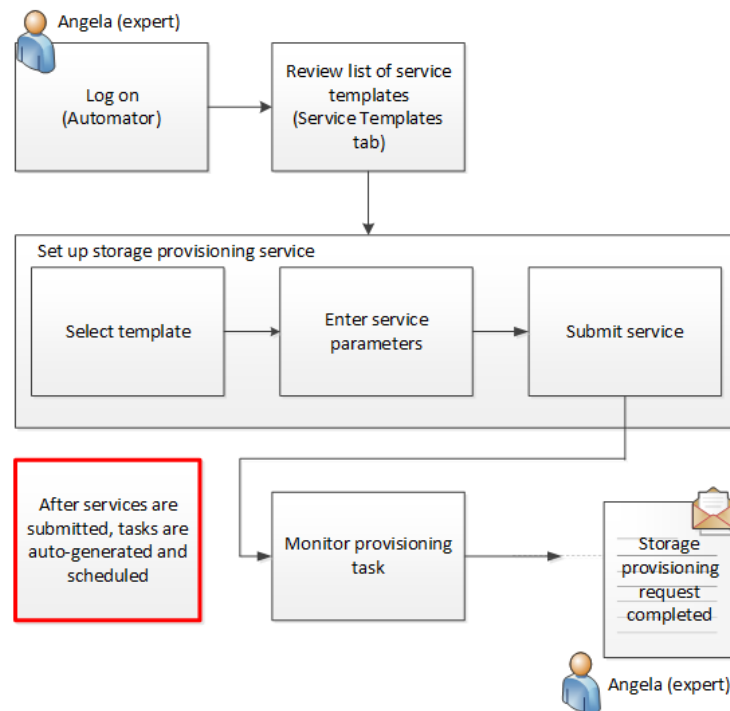
Angela is an expert administrator who usually spends much time processing storage provisioning requests from different departments in the company. Last month, her company purchased Hitachi Ops Center Automator to automate some of the manual tasks her team has been doing to process such requests. Currently, she uses homegrown management tools to configure storage resources for provisioning. After installing and configuring Ops Center Automator, she began reviewing the prepacked service templates provided with the application. Angela quickly discovered that the templates are preconfigured, greatly reducing the number of time-consuming tasks she previously had to do manually before starting the provisioning.

Angela just received a high priority request to provision storage for an Exchange 2010 server in 48 hours. Because she used a service template, she was able to reuse most of the configuration settings that she would otherwise have to do manually.

She created a new service named "Exchange 2010 provisioning" for the Legal department and added some volume-specific settings, for example, pool information, required virtual capacity, and host information, as parameters to the service and submitted the service. She scheduled it to run at 2:30 am the following day.

The next day, she found that the service was registered and submitted on time. The task generated from the service completed successfully and the required provisioning request was processed before 48 hours.

The following figure depicts the scenario.



Scenario 2: Monitoring disk allocation service

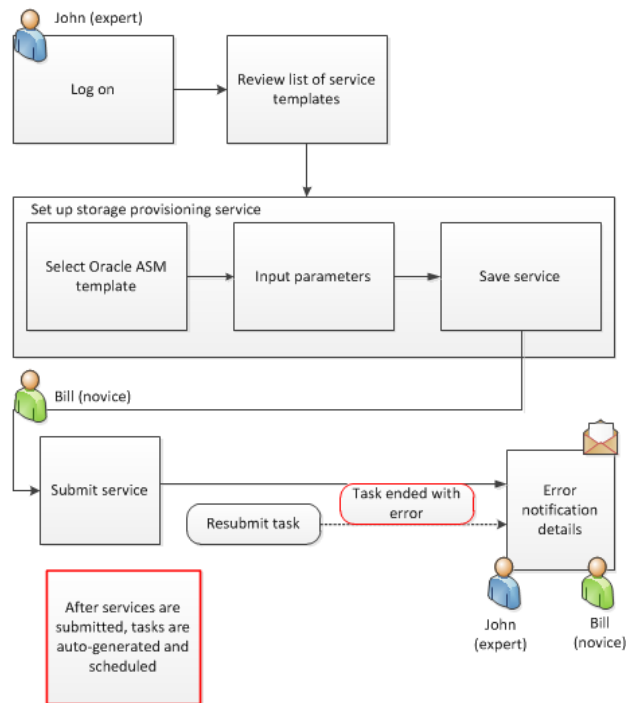
Because of the high volume of service requests for storage allocation, John who is an expert administrator has been spending at least 60% of his time closing level 1 tickets, which primarily involve preparing resources for provisioning and then monitoring the status of all submitted requests.

He is beta-testing the Ops Center Automator software, which his company is considering for purchase to help expert administrators like John to delegate level 1 duties to service users in the company.

Earlier in the day, he received a storage provisioning request for an Oracle database used by the accounting department. For this request, he decides to use an Oracle service template that will help save him the manual effort. Using the service template, he creates a service and names it "Oracle ASM for accounting." He then edits the service settings to specify the mandatory parameters, such as number of volumes required and volume capacity and saves it.

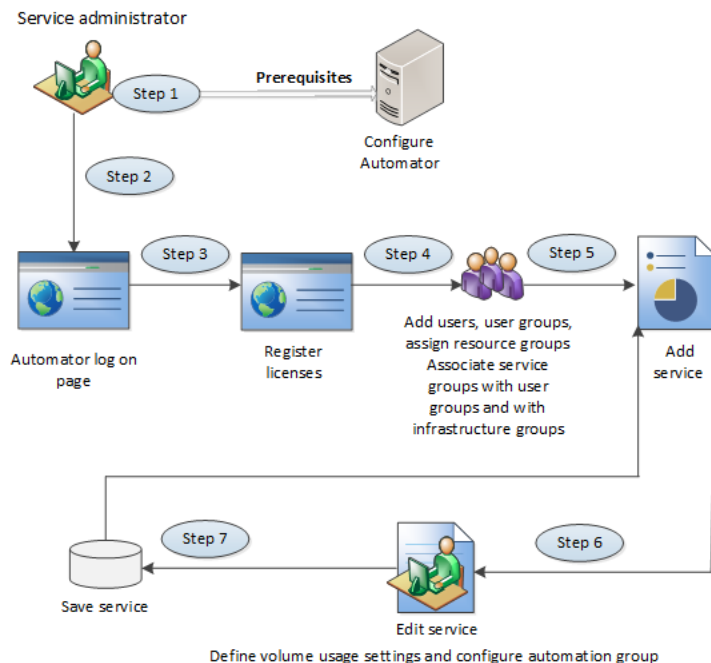
For submitting this service request, John decides to use the task management and monitoring features of the product. He asks Bill, a novice administrator (service user) to submit the "Oracle ASM for accounting" service and schedule it to run immediately. He leaves for the day after giving clear instructions on how to submit the service and then monitor the task generated from it. Following John's instruction, Bill submits the service and uses the Tasks tab in the application to monitor the task. When the task ends with an error, he gives John the error details. John recommends that Bill resubmit the task and continue to monitor it.

The following figure depicts the scenario.

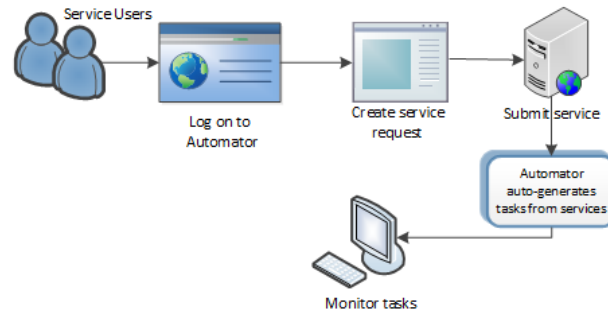


Operational workflow for service administrators and service users

The following figure shows the basic prerequisite tasks and high-level flow of operations for a service administrator.



The following figure shows the high-level flow of operations for a service user.



For more information on these workflows, including examples, see the video tutorial for [Setting Up and Submitting a Hitachi Automation Director Smart Provisioning Service](#).

Built-in user accounts

When Ops Center Automator is installed, a built-in System account is provided.



Note: This topic is about the local built-in system account. For information about the Hitachi Ops Center system account, see the *Hitachi Ops Center Installation and Configuration Guide*.

The System account (default password: manager) is for administering user management tasks, such as registering users, enabling access, and managing roles and permissions. It is also used to manage Ops Center Automator tasks and gives access to the Ops Center Automator UI. By logging on using the System account, you can access the user management window in Ops Center Automator and manage user access to storage systems registered in Ops Center Automator. The System account does not belong to any user group.



Note: For information on how to change the local built-in system account password, see the *Hitachi Ops Center Automator Installation and Configuration Guide*.

Logging on

Before you begin

To log on to Ops Center Automator, have the following information available:

- Ops Center Automator web URL
- User ID
- Password



Note: When multiple users are using the Ops Center Automator window in the web browser simultaneously, the response from Ops Center Automator might be slow. We recommend that the number of users using the Ops Center Automator window simultaneously be 6 or less.

Procedure

1. In a web browser, enter the Ops Center Automator URL:

```
http://automation-software-server-address:port-number/Automation/login.htm
```

where

- *automation-software-server-address* is the IP address or host name of the Ops Center Automator server.
- *port-number* is the port number of the Ops Center Automator server. The default port number is 22015.

To access Ops Center Automator in secure mode, enter:

```
https://automation-software-server-address:port-number/Automation/login.htm
```

where:

- *automation-software-server-address* is the IP address or host name of the Ops Center Automator server.
- *port-number* is the SSL port number of the Ops Center Automator server. The default port number is 22016.

2. Enter a user ID and password to log on.
3. Click **Login** to log in to Ops Center Automator, or click **Log in with Ops Center credentials** to log in and authenticate through Hitachi Ops Center.

Accessing user profiles

You can edit your user profile, change your password, and view permissions assigned to your profile.



Note: You can access your user profile when you log-on with local (Common Component) user authentication. To access your Hitachi Ops Center user profile, see the *Hitachi Ops Center Online Help*.

Procedure

1. Access your User Profile in one of the following ways:
 - In the global menu area, click the User icon (👤) and select **User Profile**.
 - If you are an Admin user, you can click **User Profile** in the **Administration** tab.
 - An Admin user can also access user profiles in the Administration tab by navigating to **Resources and Permissions > Users and Permissions > Users**. Click a **User ID** link to open the profile.

2. Perform one or both of the following:
 - Click **Edit Profile** to open the **Edit Profile** dialog box and change the name, email address, and description. Click **OK**.
 - Click **Change Password** to open the **Change Password** dialog box and enter the old and new passwords. Click **OK**.
3. Click **Close** to close the **User Profile** window.

Editing a user profile

You can edit a user profile when user information changes.

Procedure

1. From the **User Profile** window, click **Edit Profile**.
2. Edit the profile information, then click **OK**.
3. Confirm that the updated user profile information appears in the Users area.

Changing the password for a user account

As user passwords expire or are compromised, they can be changed.

Procedure

1. From the **User Profile** window, click **Change Password**.
2. Enter the old and new passwords and verify the new password.
3. Click **OK**.

Changing the system account password

The System account is a default account that has user management and execute permission for Ops Center Automator. When you install Ops Center Automator for the first time, you must change the System account password.



Note: This procedure only changes the local system account password. To change the Hitachi Ops Center system password, see the *Hitachi Ops Center Online Help*.

Procedure

1. From a management client, log on using the following credentials:
 - User ID: system
 - Password (default): manager
2. On the **Administration** tab, click **User Profile**.
3. Click **Change Password**, type the required passwords, then click **OK**.

Registering a license

Register a license when accessing Ops Center Automator for the first time after installation or when a license expires.

If you are using Common Services you can use the Ops Center portal to register the license. For details, see the *Ops Center Help*.



Note: You must obtain the Ops Center Automator server license from your Hitachi Vantara representative.

Procedure

1. From the Ops Center Automator login window, click **License Information**.
2. In the **License** dialog box, enter the license key using one of the following methods:
 - Click **Key** and enter the license key.
 - Click **Choose File** to navigate to the license file and select it.
3. Click **Save**.

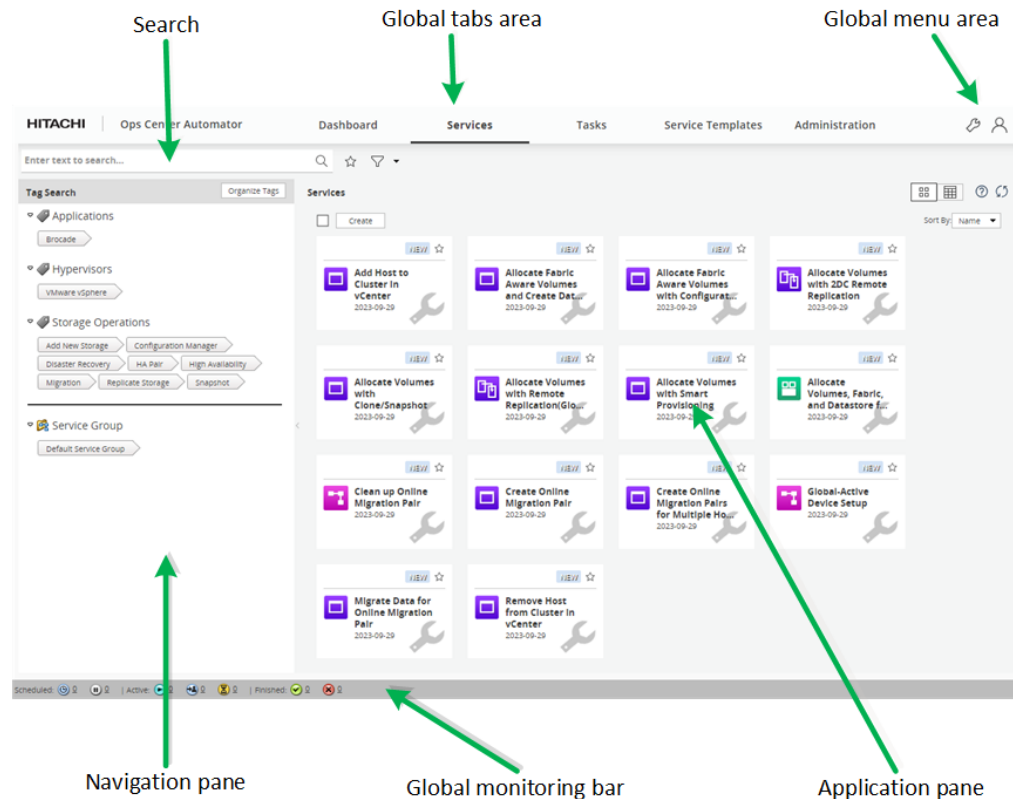
Logging off

For security reasons, log off when you have finished using Ops Center Automator.

On the Ops Center Automator global menu area, click the User (👤) icon and select Log out.

Navigating the interface

The Hitachi Ops Center Automator user interface (UI) is organized into six primary areas: global menu area, global tabs area, navigation pane, application pane, global monitoring bar, and search.



Global menu area

The global menu area has menus for accessing various features provided by Hitachi Ops Center Automator.

The global menu area is always visible, regardless of which window is active. Its two icons provide access to high-level actions and online help. The menus are:

- Tools (🔧): Click and choose from the following options:
 - Service Builder: Open Service Builder. This option is available to Admin and Developer users.
 - Reset Preferences: If you have changed some display settings such as customized dashboard layout to display your preferred reports or modified the column settings in the Services tab, and you want to undo your changes, you can restore the display setting to the original (default) settings. If you select Reset Preferences, you will be logged off of the current session. You must log on again to view the default settings.
- User (👤): Click and choose from the following options:
 - User Profile: Open the user profile.
 - Online Help: Open Help with the navigation pane visible.
 - About: Open the About window to view license information.
 - Log out: Log out of the application.

Global tabs

The Dashboard and Tasks tabs are always visible, regardless of which window is active. Access to Services, Service Templates, and Administration tabs is dependent on the user role assigned. The tabs provide access to services, tasks, and administrative functions.

Navigation pane

This pane varies with the active tab. From the navigation pane, you can access resources and frequently used tasks.

Application pane

This pane varies with the active tab. The application pane shows summary information, resource objects, and details about the current task.

Global monitoring bar

This bar is always visible, regardless of which window is active. It has links to information about submitted tasks.

Search

This box is available on the Service, Tasks, and Service Templates tab and gives keyword and criteria-based search functions.

About the idle timeout

If you log in with Ops Center credentials, and use the UI after the configured idle timeout period has elapsed, you see a session expired error message and have to log in again.

The idle timeout behavior changes depending on whether the Auto-refresh setting in Common Services is enabled or disabled:

- If enabled: The idle timeout does not occur while displaying windows that are periodically refreshed in the Dashboard window or when you select a task in the Flow window that is in Active state. The idle timeout does not occur when the Service Builder windows except for the View Flow window and the Create/Edit External Resource Provider window are displayed.
- If disabled: The idle timeout occurs on windows except for the Debugger window in Service Builder. The idle timeout does not occur while debugging on the Debugger window.

For details about the idle timeout settings, see the *Hitachi Ops Center Online Help*.



Note: If there is no user operation for a certain period of time, "Auto refresh is disabled" might be displayed at the bottom of the window and the displayed window becomes not refreshed automatically. If the window is not automatically refreshed, display it again or refresh it manually by clicking the Refresh button.

Navigating help

When you access Online Help from the User icon (👤) in the global menu area, or select the help icon [?] from the application pane or a dialog box, you can see the Ops Center Automator help and access the Contents and Search.

Navigating

- To navigate between topics, select the desired topic in Contents.
- Use the breadcrumb trail at the top of each topic to see your location, or to return to a higher-level topic.
- To find information for a specific topic, click the Related topics links.

Using navigation buttons

- Contents

Click the topic of interest to reveal topic entries and subsections. As you move through Help, the current topic is highlighted.

- Search

Gives a list of topics based on the search criteria entered in the search text box. Click topics returned by the search for details.

Using search features

Ops Center Automator gives various search methods to navigate through its content and to help find the information you want. Each tab offers different search functionality. A text search box is found on the Services, Tasks, and Service Templates tabs. In addition, you can set column filters, and apply instant filters to customize the views. You can use tags to organize and manage services, tasks, and service templates by custom categories.

Using column filters in tables

The column filter feature is provided to help search for services, tasks, or service templates by applying keywords or phrases and conditions to the table view. Column settings allow you to choose the attributes you want to display in the view. The column filters and settings are found on the table views on the Services, Tasks, or Service Templates tabs.

Column filters

You can turn on the column filters to customize the table view. Select one or more column attributes and apply filter conditions, if needed. The view continues to display its contents, using the column filters, until the feature is turned off. When the column filters are turned off, the view is visible using the default settings.

Column settings

Column settings allow you to customize the view by choosing the attributes you want to display in the view columns. Click Column Settings on the table view to see the available column attributes and their descriptions and make selections.

Using instant filters

Instant filters are available to quickly view the services that are marked as Favorite, or tasks that are marked with To Do.

Mark as Favorite

You can mark services that you frequently use as a Favorite. You can mark a service as a Favorite using any of the following methods:

- In the Card View of the Services tab, do one of the following:
 - Click the Favorite (star) icon for the service.
 - Click the service to open the service preview, then click the Favorite (star) icon.
 - Click the service to open the service preview. Click More Actions and select Mark as Favorite.
- In the Table View of the Services tab, do one of the following:
 - Click the Favorite (star) icon for the service.
 - Click the service and select More Actions > Mark as Favorite.

The services marked as Favorite appear on the dashboard. You can quickly access the services that you marked as Favorite by using the instant filter located next to the text search box on the Services tab, or sorting by the Favorite column in the view.

Mark as To Do

If you must pay attention to a task or respond to a task, you can mark it as To Do. You can mark a task as To Do using any of the following methods:

- In the Table View in the Tasks tab:
 - Select More Actions > Mark as To Do for the task, or:
 - Click the Mark as To Do flag for the task in the To Do column.
- In the **Task Details** window, click Mark as To Do.

You can quickly access the tasks that you marked as To Do by using the instant filter (red flag) located next to the text search box on the Tasks tab, or sorting tasks by the To Do column in the view. Tasks marked as To Do are seen by all users.

About tags

Tags are keywords or phrases that help classify and organize content by function, ownership, status, or other category. You can create custom tags, and assign tags to groups to manage service templates, services, and tasks. You can use tags to quickly sort and search for a service template, service, or task.

Tags are available on the navigation pane of the Services, Tasks, and Service Templates tabs. Only tags used in the tab are visible. You can click one or more tags to filter and quickly view the content by the associated tag. Click Clear to reset the view to the default settings.

Creating and assigning tags to services

You can add, modify, or remove tags when creating or modifying a service. Users with Develop or Admin roles can create or update a tag for a service.

You can assign tags to a service in the **Edit Service** window of a service. When a service is submitted, the associated tasks inherit the tags from its service and cannot be modified.

When a service is created from a service template, the service inherits the tags from the service template. The Admin or Develop role is required to create and update a tag for a service template. You cannot change the tags that are assigned by a predefined service template.

When creating a custom tag, assign a unique tag name. Duplicate tag names are not allowed. You can assign multiple tags to services templates and services.

Procedure

1. On the **Services** tab, click the service whose tags you want to modify to open the service preview window for that service.
2. Click **Edit** to open **Edit Service** window.
3. In the **Settings** pane, modify tags for the service in the **Tags** box. You can perform any of the following:
 - To add tags, expand the list and select the tags.
 - To remove a tag, click the "X" next to the tag.
 - To create a tag, scroll to the end of the tag list, select **Create Tag**, enter a name and tag group for the new tag, then click **OK**.
 - To create a tag group, first create a tag. Then scroll to the bottom of the **Tag Group** list, then click **Create Tag Group** to enter a tag group name. Click **OK**.
4. Click **Save**.

Creating tag groups

Tag groups help sort and categorize the service templates, services, and tasks. The Admin or Develop role is required to create or modify tag groups.

You can organize tags in tag groups by dragging and dropping the tags to the correct group. Each tag can belong to only one tag group. A tag group cannot belong to another tag group. Tags without a tag group are listed as Uncategorized.

Procedure

1. Create a custom tag group by using one of the following methods:
 - On the **Tag Search** navigation pane:
 - a. Click **Organize Tags**.
 - b. In the **Organize Tags** dialog box, go to the tag group section and enter the new tag group.
 - When creating or modifying a service:
 - a. In the **Edit Service** window, go to the **General Information** section **Settings** pane, then click inside the **Tags** area to open the list of tag groups and tags.
 - b. Scroll to the bottom of the list, then click **Create Tag**.
 - c. In the **Create Tag** dialog box, enter a tag name, then click the **Tag Group** list to open it. At the end of the list, click **Create Tag Group** and enter a tag group name.
 - d. Click **OK** to save the tag group and the tag.
2. Click **OK** to save the tag group.

Result

You can search for tags and tag groups from the **Tag Search** navigation pane located on the Services, Tasks, or Service Templates tab.

User workflows by role

Ops Center Automator supports four user roles and each has its own workflow.

Admin user workflow

The Admin user configures Ops Center Automator.

The Admin user role is the only one that confers access to the Administration tab and the Admin user is responsible for configuring Ops Center Automator. The Admin user also has access to all parts of Ops Center Automator and Service Builder.

The Admin user workflow in the Administration tab is as follows:

1. Log on to Ops Center Automator.
2. Click the Administration tab.
3. Connect to one or more instances of Configuration Manager.
4. Configure agentless remote connections as needed.
5. Create users. This step is not necessary if you have integrated users from Common Services.
6. Configure user groups, if needed. Ops Center Automator includes four built-in user groups.

7. Create infrastructure groups and assign resources to them. If necessary, you can also assign Web Service Connections and agentless remote connections to infrastructure groups.
8. Create service groups and associate user groups with service groups. This step also assigns the user role (Admin, Develop, Modify, Submit) associated with the user group.
9. Associate infrastructure groups with the service groups to enable the services in the service group to use the resources in the infrastructure groups.

Develop user workflow

The Develop user creates service templates in Service Builder and tests them in Ops Center Automator before releasing them for use.

Much of the Develop user's workflow takes place in Service Builder. The Develop user has access to all parts of Ops Center Automator except the Administration tab.

The Develop user workflow is as follows:

1. Log on to Ops Center Automator and start Service Builder.
2. Create or modify a service template in Service Builder.
3. Build the service template in Service Builder.
4. Test the service template in Ops Center Automator.

At this point the template is not available for use.

5. Release the template from Service Builder.

After the template is released, you can access it in Ops Center Automator and use it to create services.

Modify user workflow

The Modify user creates and tests services and is typically a service administrator.

The Modify user role is designed to enable expert users to create services from within their service groups. This means that the Modify user can only create services that are in the service group that is associated with the Modify user's user group.

The Modify user can access the Dashboard, the Services tab, the Tasks tab and the Service Templates tab.

The Modify user workflow is as follows:

1. Log on to Ops Center Automator and access the Service Templates tab to find a service template.

The Modify user can only view service templates that are released.

2. Locate a service template that matches the service requirements.
3. Use the service template to create a service.
4. Test the service.
5. Release the service for use.

Submit user workflow

The Submit user role is a user of services created by the Modify user.

The Submit user can only access services that have already been released and does not have access to the Debug tab in the Tasks tab. The Submit user can access the Dashboard, the Services tab and the Tasks tab.

The workflow for the Submit user is as follows:

1. Log on to Ops Center Automator and access the Services tab.
2. Select the service that you want to submit and create a request. Submit the service.
3. Click the Tasks tab to verify that tasks associated with the service are in the Tasks tab.
4. (Optional) Monitor the tasks and their status.

Starting Service Builder

Users with the Admin role or the Develop role can start Service Builder to create and edit templates.

Service Builder can be started from three different points.

Open Service Builder in one of these three ways:

- Click the Dashboard tab, then click one of the options under Manage Template in the Guidance Menu:
 - Create New Template
 - Edit Template
 - Copy Template
- In the global menu area, click the Tools icon (🔧) and select Service Builder.
- Click the Templates menu and in the Templates pane, click one of the following: Create, Copy and Edit, View Flow, or More Actions > Update Service Template.



Note: Update the Service Template if there is a more recent revision of the template available.

Service Builder opens in a separate browser window.

Service Builder workflow

Creating a service template with Service Builder involves the following processes:

Phase 1: Preparing

- Decide on the need and purpose of the service template. Consider the steps involved to automate the process and determine if the steps require creating a new template or modifying an existing template.
- Prepare to create the service template. This involves identifying existing plug-ins, or creating new plug-ins (preparing icon files, and setting definition, resource files and script files).

Phase 2: Creating

- Create new plug-ins, or copy and modify existing plug-ins, in the Service Builder Edit view of the service template.
- Create the service template as new, or copy and modify an existing service template, in the Service Builder Edit view. The service template is in Under Development status.
- Set the process flow of the service template.
- Create and map the data flow of the service template.
- Set the service definitions of the service template.

Phase 3: Testing

- Build the service template for testing.
- Perform testing. Create services based on the debug configuration of the service template.
- Make corrections as the result of testing.
- Rebuild and retest the service template until it performs properly.

Phase 4: Releasing

- Release the service template. A service template must be in Released status to submit the service template to the operating environment.

Chapter 2: Viewing service and task summaries

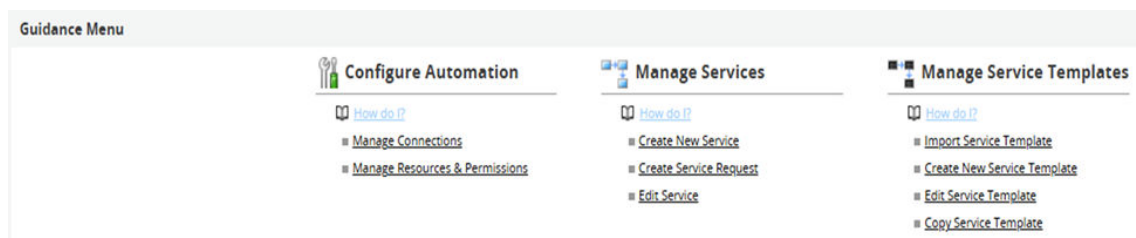
The Ops Center Automator dashboard gives immediate insight on the status of services and tasks and enables easy access to user workflows.

Viewing the dashboard

When you log on to Ops Center Automator, the dashboard appears by default. The dashboard comprises the Guidance menu, reports on the performance of services and tasks, and links to favorite services.

Guidance Menu

The Guidance menu serves as a navigation pane and gives links to information on how to perform common functions in Ops Center Automator. The current user role determines which categories are visible. This menu pane can be turned on or off using the Dashboard Settings.



Dashboard reports

The dashboard reports show information based on status and performance. You can quickly access services and tasks by clicking the links in these reports.

The dashboard reports update every 4 minutes.

The following reports appear on the dashboard:

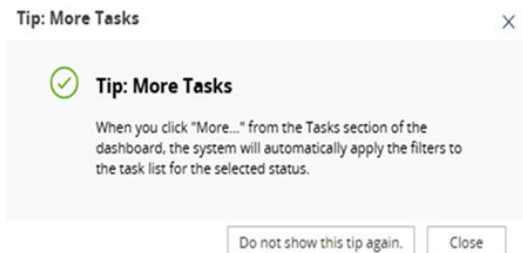
- Most Frequently Failed Services
- Most Frequently Used Services
- Tasks Waiting for Action
- My Tasks
- My Favorite Services

Customizing the dashboard display

You can customize what is visible on the dashboard. Either select or clear the check boxes for the items that must appear on the dashboard. You can also click the Settings icon to open the **Settings** dialog box and select the reports you must see.

Dashboard tips

Helpful tips are provided when following links from the dashboard. These tips can be turned off as you become more familiar with Ops Center Automator.



Viewing dashboard reports







The dashboard reports provides you with quick access to the status and performance of services and tasks and updates every four minutes.

The following sections provide information about each dashboard report.

Most Frequently Failed Services report

The Most Frequently Failed Services report has a ranked list (highest to lowest) of services with the largest number of failed tasks.

The Most Frequently Failed Service report can be viewed by Admin, Develop, and Modify users.

Most Frequently Failed Services		
Service	Failed	Last Failed Date
 Execute Remote Command	13	2020-01-07
 Add virtual server (LU creation)	13	2019-12-19
 Check env. for adding virtual server	11	2019-12-19
 Citrix XenDesktop on Microsoft Hyper-V	7	2019-12-19
 Citrix XenDesktop on VMware vSphere	5	2019-12-19
 Exchange Server	2	2020-01-07

[More...](#)

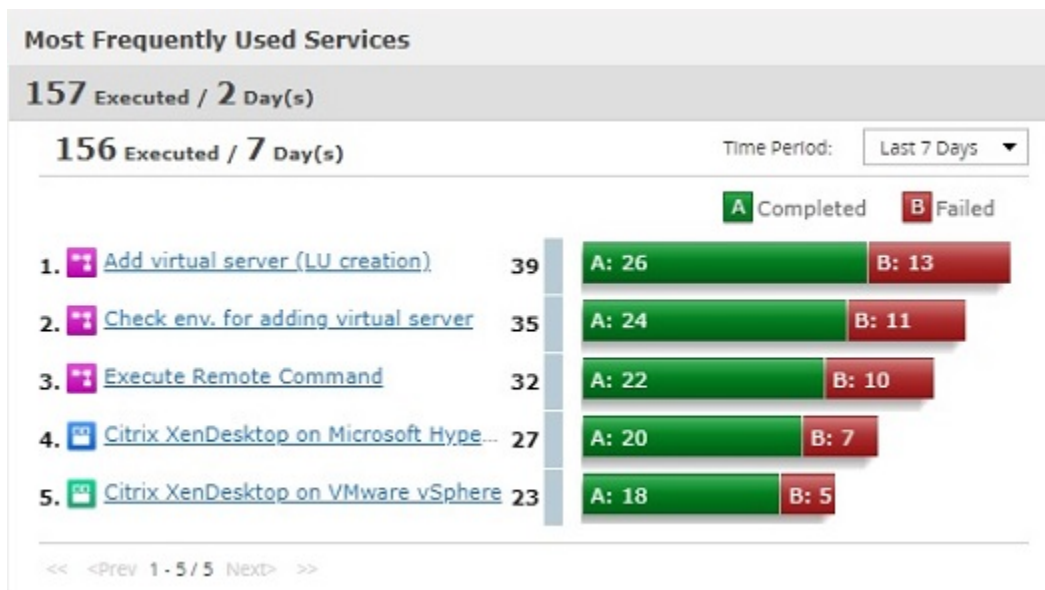
You can click a link to open the Service Preview, where you can access further actions to take.

Most Frequently Used Services report

The Most Frequently Used Services report summarizes the most frequently used services from the last seven or 30 days.

This report helps users to analyze the success/failure rate of their most frequently used services and take any necessary action.

The first row at the top of the window shows the number of times the service has been run and the number of days since Ops Center Automator was installed. The second row shows the number of times the service was run in either 7 or 30 days. You can use the Time Range list to choose one or the other.



You can click a link to open the Service Preview, where you can access further actions.

Tasks Waiting for Action report

The Tasks Waiting for Action report is a summary of failed and long-running tasks and tasks that need user input.

The report lists tasks that need your attention, which includes the following:









- Tasks that need your input to proceed.
- Recently failed tasks, so you can fix the problem that caused the task to fail and run the task again.
- Long running tasks that can affect system performance.

Tasks Waiting for Action			
 3 Recently Failed			More...
	Execute Remote Command 20...	less than 1min ago	 Execute Remote Command
	Execute Remote Command 20...	less than 1min ago	 Execute Remote Command
	Execute Remote Command 20...	less than 1min ago	 Execute Remote Command
 0 Long Running			More...
 0 Waiting for Input			More...

If any tasks exist, the link gives a list of the specific tasks. Otherwise, the link opens the Tasks tab, filtered by the status.

My Tasks report

The My Tasks report gives a summary and links to the active, completed, and scheduled tasks of the current user.

My Tasks			
0 Active			More...
4 Finished			More...
	Citrix XenDesktop on VMware ...	4 minute(s) ago	 Citrix XenDesktop on VMware ...
	Citrix XenDesktop on VMware ...	4 minute(s) ago	 Citrix XenDesktop on VMware ...
	Citrix XenDesktop on VMware ...	5 minute(s) ago	 Citrix XenDesktop on VMware ...
	Citrix XenDesktop on Microsof...	6 minute(s) ago	 Citrix XenDesktop on Microsoft...
0 Scheduled			More...

The task states and corresponding statuses are as follows.

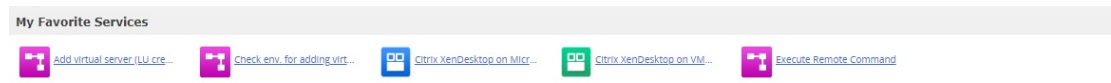
Task state	Task status
Active	<ul style="list-style-type: none"> ▪ In Progress ▪ In Progress (with Error) ▪ In Progress (Terminating) ▪ Waiting for Input ▪ Long Running
Scheduled	<ul style="list-style-type: none"> ▪ Waiting ▪ Suspended
Finished	<ul style="list-style-type: none"> ▪ Completed ▪ Failed

If any tasks exist, the link gives a list of the specific tasks. Otherwise, the link opens the Tasks tab, filtered by the status.

My Favorite Services report

The My Favorite Services report is the list of services that are designated as favorites by the current user.

The My Favorite Services report is available on the dashboard. You can add to this list by marking services as favorites on the Services tab.



You can click a link to open the **Submit Service Request** window for that service.

Chapter 3: Managing services

This module describes how to manage Ops Center Automator services.

Overview of Ops Center Automator services

A service is a customized set of instructions that follow a process flow to automate data center tasks such as provisioning. Services are integrated with infrastructure groups so they help manage resources. A storage administrator can create a service and then allow users to run it. Access to services is managed by user groups and service groups.

Services are classified by tags to indicate the purpose or type and to display them in a hierarchical structure. Because Ops Center Automator lets you register the same service in multiple tags, you can display a list of services according to usage, such as by workload or business unit.

Services tab

The Services tab includes the views and tools to search for, create, submit, organize, and manage automated services.

The Services tab enables users to do the following:

- View services and filter them using tags.
- Create custom tags or tag groups using Organize Tags.
- Using the Card view or Table view, see service details, status, and actions.
- Create and submit service requests.
- Copy a service to make a new service.

Tag Search pane

The Tag Search pane enables users to filter services that have been tagged.

Tags are organized into groups, such as Applications, Hypervisors, and Storage Operations. Each group has one or more tags.

To use tags, click a tag name to see only services tagged with that name in the Services pane. Click the tag again to expose all tags in that group and all services that were filtered out.

You can only use one Service Group tag at a time.

You can click Organize Tags to create your own tag groups and then add tags to the groups. You can also add tags to the provided groups.

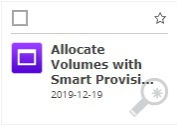

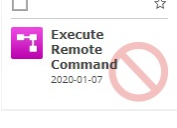
Services pane

The Services pane displays all the services that a user can use, based on the user's permissions.

The Services pane has two views; Card View and Table View. You can toggle between these views in the Services window.

The Card View includes graphical representations of services that can include badges and watermarks.

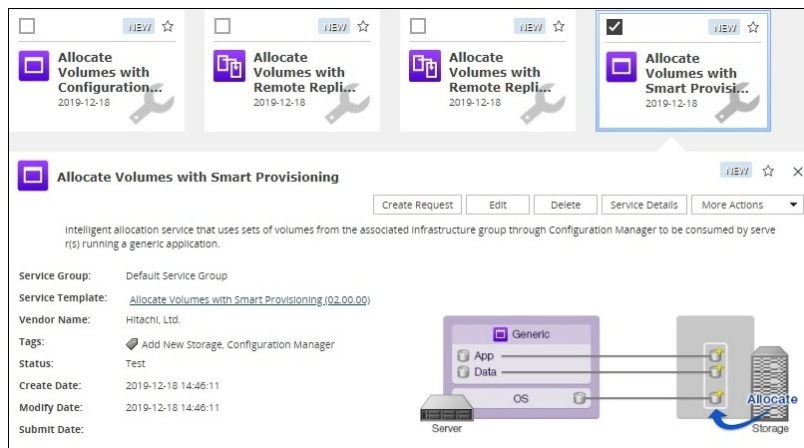
The following table contains the watermarks that are visible in the services Card View.

Watermark	Description
	Service is in Debug status.
	Service is in Test status or Maintenance status.
	Service is in Disable status.

The following badges are visible in the services Card View:

- **OUTDATED:** The service is using an outdated version of a service template. You can use Apply Latest Version to update the service.
- **NEW:** The service is fewer than 14 days old.

You can click a service card to open the service preview and view information about the service and access additional controls as shown in the following figure.



The following actions are available to manage services in the Services tab or in the service preview:

- **Create:** Opens the **Select Service Template** window, where Admin, Develop and Modify users can select a template and use it to create new services.
- **Create Request:** Runs the service by creating the tasks required to perform the service.
- **Edit:** Modifies a service.
- **Delete:** Deletes a service.
- **Copy:** Copies a service to create a new service.
- **Release:** Changes the status of the service to Released.
- **Enable:** Allows the service to be submitted.
- **Disable:** Prevents the service from being submitted and changes its status to Disable.
- **Maintenance:** Allows only the Admin, Develop, or Modify roles to submit the service for maintenance purposes.
- **Edit tags:** Allows modification of the tags associated with the service.
- **Mark as Favorite:** Adds the service to the My Favorite Services list of reports on the Dashboard for quick access.
- **Unmark as Favorite:** Removes the service as a favorite.
- **Related Tasks:** Displays the tasks related to the service under the Tasks tab.
- **Reset Counter:**
- **Apply Latest Version:** Applies the latest version of the template on which the service is based.
- **Apply Specified Version:** Enables user to choose among version of the template on which the service is based.

Workflow for creating a service

The following workflow describes the process to create, test, and release a service.

1. Choose a template or an existing service as a starting point.
2. In the **Create Service** window, fill out the required and optional fields. Preview the service and then save it.
3. Test the service.
4. Release the service. After the service and its tasks successfully complete the testing, the service can move to Release status. In Release status, users with the Submit role (or higher) can submit the service.
5. Submit the service.

Creating or editing a service

Users with the Admin, Develop, or Modify roles can create services. You can create a new service, copy an existing service, or edit a service.

Procedure

1. Determine whether you want to create a new service or copy or edit an existing service:
 - To create a new service, go to step 2.
 - To copy a service, go to step 8.
 - To edit a service, go to step 9.
2. Create a new service by accessing the service template preview using one of the following paths:
 - On the **Dashboard**, in the **Guidance Menu**, click **Create New Service**. In the **Select Service Template** window, click a template to open the service template preview.
 - On the **Service Templates** tab, click the service template you want to use to open the service template preview.
 - On the **Services** tab, in the **Services** pane, click the **Create** to open the **Select Service Template** window and then click a template to open the service template preview.
 - On the **Administration** tab, under **Resources and Permissions**, click **Service Groups**. In the **Services** pane, click **Create** to open the **Select Service Template** window. Click a template to open the service template preview.
3. Click **Create Service**.
4. In the **Create Service** window, in the **Settings** pane, enter the following information, which is summarized in the **General Settings** area of the Navigation pane:



Note: If you copy an existing service, the default parameter values are different than if you are creating a new service.



Note: In the **Create Service** or **Edit Service** window, if you do something that does not involve communication, such as entering values, and the session is not updated for a long period of time, then the session expired error might occur when you try to finish the operation. Click **Save and Close** before the idle timeout occurs due to the session expiration.

- Name of the service.
- Description of the service.
- **Status:** Select **Test** for new services to allow only users in the Admin, Develop, or Modify role to submit the service.
- **Tags:** Specify one or more tags for the service (to a maximum of 256 characters.) The tags you select for the service also apply to the tasks the service generates.

- **Service Group:** Select the service group of users who can access the service.



Note: If you are editing an existing service, you cannot change the service group. Use the **Copy** action instead to copy the service and change the Service Group.

- **Service Template:** The template on which the service is based. Click the template name to open the **Template Preview**, which includes detailed information about the template.

In the **Template Preview**, you can click **View Flow** to open the flow window for the template.

5. Expand **Advanced Options** and select the options you want:

Scheduling Options:

Immediate: Run the service when it is submitted.

Scheduled: Run the service one time.

Recurrence: Run the service multiple times.

6. In the **Navigation** pane, click each settings group and configure the required and optional parameters. You can also navigate through the settings groups using the links at the bottom of the Settings pane.

You can choose to retain default settings from the service or template you started with. For Volume settings, you can choose whether to allow users to change specific settings or to hide them completely.

7. After configuring the settings, do one of the following:

- Click **Preview** to open a view of the service as it would appear to users. Then click **Save and Close** to save the service.
- In some cases, you might want to use **Import** or **Export** to save the property values associated with the current service for later access or to access property values that have previously been saved to a properties files.
- Click **Cancel** to close the window without saving any changes.

8. To copy an existing service, do the following:

- a. Go to the **Services** tab to access the service list.
- b. Click the service that you want to copy.
- c. In the service preview pane, click **More Actions > Copy**.
- d. Modify the service name and settings as needed.

9. To edit a service, do the following:

- a. Go the **Services** tab, select the service to edit, then click **Edit**.
- b. From the **Edit Services** window, modify the setting as needed.

Create Service window

The **Create Service** window enables you to select the parameters of your service and preview the result before saving. Admin, Develop, and Modify users can create services.

The **Create Service** window includes the following areas:

Overview pane

The Overview pane includes a written description of the template and a graphical representation of the hardware and data structure.

Navigation pane

The Navigation pane has settings groups that include General Settings and any other settings that are required or optional for the service. You can click a settings group to display and edit the settings in the Settings pane. You can also navigate through the settings groups using the links at the bottom of the Settings pane.

The settings groups vary according to the template or service upon which the service is based. If settings are required, a graphic warning will display in the settings group.

Settings pane

Use the Settings pane to edit or create the parameters for your service.



Note: If you are copying an existing service, the default values for the parameters will be different than if you are creating a service.

Settings/Parameters	Description
Name	Name to display in the Services tab.
Description	Description of the service.
Status	The status of the service. Two options are available for creating a service. Select Test for new services to allow only users in the Admin, Develop, or Modify role to submit the service.
Tags	Tags act as filters in the Tag Search pane of the Services window. A service has one or more tags for the service (to a maximum of 256 characters). The tags you select for the service also apply to the tasks generated by the service.
Service Group	The service group of users who can access the service. Note: If you are editing a service instead of creating a new service, you cannot change the Service Group. To change the Service Group, use the Copy action to copy the service.
Service Template	The service template used by the service. You can click the template name to open the Template Preview, which includes detailed information about the template. In the Template Preview, you can click View Flow to open the flow window for the template.

Settings/Parameters	Description
Advanced Options	<p>Scheduling options for the service.</p> <ul style="list-style-type: none"> ▪ Scheduling Options: <ul style="list-style-type: none"> • Immediate: Run the service when it is submitted. • Scheduled: Run the service one time. • Recurrence: Run the service multiple times. ▪ Display Flow Detail for Submit User: Select to display.
Import	Imports property values from a specified file.
Export	Exports property values to a specified file.
Preview	Opens a view of the service as it will appear to a user.
Save and Close	Saves the service to the system and closes the window.
Cancel	Cancels any changes and closes the window.

Testing a new service

New services are created in Test status, so that only users with the Admin, Develop, or Modify role can submit them. When a service in the Test status is submitted, tasks are created in the Test status to allow testing. Tasks in the Test status are located on the Debug view under the Tasks tab. During testing, you can change the service parameters as needed and continue testing until the tasks run successfully.

Procedure

1. To begin testing, submit the service.
 - a. On the **Services** tab, select the service to test and in the service preview pane, click **Create Request**.
 - b. In the **Submit Task** window, keep or modify the volume, host, and task settings, then click **Submit** to submit the service or **Submit & View Task** to view the tasks.
2. On the **Tasks** tab, click the **Debug** tab and review the status of the tasks related to the service.
3. If the task status is anything other than Completed, repeat steps 1 and 2 until all of the tasks are successful.

Next steps

Release the service.

Releasing a service

You place a service in Release status to submit it. Users in the Submit role or higher can submit a service in Release status. You can move a service to Release status from the Test status after testing is complete, or from the Maintenance status after a blackout period.

Procedure

1. On the **Services** tab, select the service to release.
2. From the table view or from the service preview pane of the card view, click **More Actions > Release**.

Submitting a service

Submitting a service creates and runs the tasks associated with the service, either immediately or on the schedule you defined. Some services require that you provide some of the parameter values when the service is submitted. All services need for you to configure task settings (for example, the task name and schedule) when the service is submitted.

Before you begin

- If the service is in Release status, you must have the Submit (or higher) role.
- If the service is in Maintenance status, you must have the Admin, Develop, or Modify role.

Procedure

1. On the **Services** tab, select the service that you want to submit, and in the service preview pane, click **Create Request**.
2. In the **Submit Service Request** window, in the **Settings** pane, configure the volume, host, and task settings required by the service.



Note: In Task Settings, a schedule is interpreted as a server time. Be aware if the server is in a different time zone from the client.



Note: In the **Submit Service Request** window, if you do something that does not involve communication, such as entering values, and the session is not updated for a long period of time, then the session expired error might occur when you try to finish the operation. Click **Submit** before the idle timeout occurs due to the session expiration.

3. Click **Submit** to submit the service immediately, or **Submit & View Task** to submit the service and go to the **Tasks** tab.
4. Verify that the tasks that are associated with the submitted service are listed on the **Tasks** tab.
5. (Optional) Monitor the task status.



Note: You can run only 10 plug-ins concurrently by default. After you reach that limit, the next plug-in waits until another one finishes. To change the maximum number of concurrent runs, see "Changing the system configuration" in the *Hitachi Ops Center Automator Installation and Configuration Guide*.

Effect on scheduling when switching between standard and daylight savings time (U.S and Canada only)

When a server is in a region of the world that has adopted daylight savings time, you must understand how the scheduling time is affected when the system switches between standard and daylight savings time. Daylight savings time begins at 2:00 AM (Central Time) on the 2nd Sunday of March and ends at 2:00 AM on the 1st Sunday of November.

To accommodate switching between standard time to daylight savings time, the time between 2:00 AM to 2:59 AM is omitted and any services that are scheduled during standard time will instead start at 2:00 to 2:59 AM daylight savings time.

Conversely, when switching back from daylight savings to standard time, the time between 1:00 AM and 1:59 is increased so any services scheduled to run during daylight savings time are ignored (not processed twice) according to the original schedule, but are run when the time is switched back from daylight savings to standard time.

Services that are scheduled outside of these switching time are not affected and are run according to the time plan that is currently in effect for the server.

Disabling a service

When a service is no longer needed, you can change its status to Disabled. You cannot submit a service that is disabled. The Admin, Develop, or Modify role is required to disable a service.

Procedure

1. On the **Services** tab, select the service to disable.
2. From the table view or from the service preview pane of the card view, click **More Actions > Disable**.

Deleting a service

Before you begin

You can delete services that are obsolete and no longer needed. Deleted services cannot be recovered. The Admin, Develop, or Modify role is required to delete a service.

On the Tasks tab, in the task view, verify that no tasks exist from the service you are deleting. You can, however, delete a service for which corresponding task entries are in the history list.

Procedure

1. On the **Services** tab, from the card view, select the service that you want to delete.

2. In the service preview pane, click **Delete**.



Tip: You can delete multiple services simultaneously. On the **Services** tab, from the table view, select the services you want to delete, click **Delete**.

3. In the **Delete Services** confirmation dialog box, click **OK**.

Updating the service template version applied to the service

You can update the service template version applied to the service when you have imported a new service template. The Admin, Develop, or Modify role is required to update a service template version.

Before you begin

Archive all the tasks generated from the service before you update. To keep those tasks as they are, copy the corresponding service and update the applied service template version of the copied service.

On the Tasks tab, in the task view, verify that no tasks exist that were generated by the service with which you are updating the applied service template version. You can update a service template version applied to the service with corresponding task entries in the history list.

Procedure

1. On the **Services** tab, from the card view, select the service for which you want to update the applied service template version.
2. In the service preview pane, click **More Actions > Apply Latest Version**.
3. In the **Apply Latest Version** dialog box, confirm that the latest service template you imported is displayed and click **Apply**.
4. In the **Apply** confirmation dialog box, click **OK**.

Applying a specific service template version to the service

You can apply the specific service template version to the service. The Admin, Develop, or Modify role is required to apply the specific service template version to the service.

Before you begin

On the Tasks tab, in the task view, verify that no tasks exist that were generated from the service to which you are going to apply the specific service template version.

You can apply the specific service template version to the service with corresponding task entries in the history list.

Archive all of the tasks generated from the service before you apply the service template version. To keep those tasks as they are, copy the corresponding service and apply the specific service template version to the copied service.

Procedure

1. On the **Services** tab, from the card view, select the service to which you want to apply the specific service template version.
2. In the service preview pane, click **More Actions > Apply Specified Version**.
3. In the **Apply Specific Service Template Version** dialog box, select the preferred service template version from the **Service Template Version** menu, then click **Apply**.
4. In the **Apply** confirmation dialog box, click **OK**.

Example of provisioning

This section describes the steps to provision volumes using the predefined Allocate Volumes with Smart Provisioning template and service creation wizard. The service administrator creates a new service called "Allocate Volumes Example" and sets the parameters using default values. The service is tested and released to the service user, who then configures and submits the service, and monitors the tasks.



Note: The example assumes that the service administrator has considered the system's architecture and performed the calculations necessary to create a service based on the needed storage size, configuration, and I/O profile. Although the values in the template are based on the best practices, the values you set might differ depending on your specific needs.

Create the service

The following steps are performed by a service administrator with the Admin role.

1. On the Service Templates tab, select the Allocate Volumes with Smart Provisioning template, then click Create Service.
2. In the **Create Service** window, in the Settings pane, enter the following information.

Enter the following general information.

Parameters	Description	Value
Name	The name of the service	Allocate Volumes Example
Description	A brief description of the service	A test service to allocate volumes
Status	The status of the service	Test
Tags	The categories for the service	Allocate New Storage, Configuration Manager
Service Group	The service group of users who can access the service	Default Service Group
Advanced Options		

Parameters	Description	Value
Scheduling Options	The time when the service runs	Immediate
Action Options	The actions that can be performed for the task.	-

Enter the following Volume information.

Parameter	Description	Value
Configuration Manager Connection	The Configuration Manager connection	Select the Configuration Manager Connection from the table.
Storage System Selection	Specifies whether to select the storage system at volume allocation	Automatic
Capacity Format	The volume capacity format as Block or Byte	Byte
Volume Settings		
Volume Usage	The volume usage to be assigned	OS
Number of Volumes	The number of volumes to allocate for the OS	1
Volume Capacity	The volume capacity in bytes	150
Volume Label	The volume label	-
Disk Type	The disk type to be used to configure the pool	-
LDEV ID Starts From	The startup LDEV ID as a hexadecimal number for the volume to allocate	0
Virtual LDEV ID Starts From	The startup Virtual LDEV ID for the volume to allocate	0
LUN Starts From	The starting logical unit number assigned to the volume for a host	0
Volume Settings		

Parameter	Description	Value
Volume Usage	The volume usage to be assigned	App
Number of Volumes	The number of volumes to allocate for the App	1
Volume Capacity	The volume capacity in bytes	200
Volume Label	The volume label	-
Disk Type	The disk type to be used to configure the pool	-
LDEV ID Starts From	The startup LDEV ID as a hexadecimal number for the volume to allocate	0
Virtual LDEV ID Starts From	The startup Virtual LDEV ID for the volume to allocate	0
LUN Starts From	The starting logical unit number assigned to the volume for a host	0
Volume Settings		
Volume Usage	The volume usage to be assigned	Data
Number of Volumes	The number of volumes to allocate for the Data	1
Volume Capacity	The volume capacity in bytes	450
Volume Label	The volume label	-
Disk Type	The disk type to be used to configure the pool	-
LDEV ID Starts From	The startup LDEV ID as a hexadecimal number for the volume to allocate	0
Virtual LDEV ID Starts From	The startup Virtual LDEV ID for the volume to allocate	0

Parameter	Description	Value
LUN Starts From	The starting logical unit number assigned to the volume for a host	0

3. Click Save and Close.

The new service called Allocate Volumes Example is created in Test status and can be found on the Services tab.

Test and release the service

Only users with the Admin, Develop, or Modify role can submit a service in Test status.

1. On the Services tab, select the Allocate Volumes Example service in Test status, then click Create Request.
2. In the **Submit Service Request** window, in the Settings pane, retain the values for the Volume Settings and enter the following information.

Parameters	Description	Value
Host Settings		
Number of Hosts	The number of hosts for which to allocate volumes	Single
Host Name	The host name	TestHostName
WWN Settings	WWN settings	Click the + icon and enter the information.
Task Settings		
Task Name	The name of the task	Allocation Task Example
Description	A brief description of the task	A test task to allocate volumes
Schedule Type	The time when the task runs	Immediate

3. Click Submit.
4. In the **Submit Service** confirmation dialog box, click OK.
5. On the Tasks tab, in the Debug view, select the Allocation Task Example task, then click Show Details to view the task summary, details, result, log, and notes.
6. When the task status is Completed, release the service. On the Services tab, in the service preview pane, select the Allocate Volumes Example service, then click More Actions > Release.

Submit the service

The following steps are completed by a service user with the Submit or Modify role.

1. On the Services tab, select the Allocate Volumes Example service in Release status, then click Create Request.
2. In the **Submit Service Request** window, in the Settings pane, retain the values and enter the following information.

Parameters	Description	Value
Host Settings		
Number of Hosts	The number of hosts for which to allocate volumes	Single
Host Name	The host name	TestHostName
WWN Settings	WWN settings	Click the + icon and enter the information.
Task Settings		
Task Name	The name of the task	Allocation Task Example
Description	A brief description of the task	A test task to allocate volumes
Schedule Type	The time when the task runs	Immediate

3. Click Submit.
4. In the **Submit Service** confirmation dialog box, click OK.
5. On the Tasks tab, in the Tasks view, select the Allocation Task Example task, then click Show Details to view the task summary, details, result, log, and notes.

Chapter 4: Managing scheduled tasks

On the Tasks tab, you can monitor tasks, view task details, and perform task management functions, such as suspend, resume, stop, resubmit, or cancel tasks.

About tasks

Tasks perform the functions of the service such as allocate or create volumes, or commence replication. Tasks are generated automatically when a service is submitted. You can monitor the progress of a task as it runs its function through completion.

The dashboard gives a quick way to monitor the tasks. From the dashboard, you can view the tasks that were generated by the services you submitted, or see the tasks that need a response. The Global Monitoring Bar Area found at the bottom of every tab in Ops Center Automator shows a collective summary of the task status.

You can manage tasks from the Tasks tab. Active tasks are categorized by the tags that were assigned to its service and by task status. Tasks that were generated by testing services are found on the Debug tab. Archived tasks are found under the History tab. Various actions are available to manage tasks such as stopping, canceling, or resubmitting tasks.

Each task has task details to provide more in-depth information about the task and its relationship to the service. The details contain information such as the task name, description, type of schedule, start time, and the status of each functional step of the task. This is useful information when monitoring or troubleshooting a task.

A task monitoring area is shown beneath the main tasks that gives details for each step associated with a task. From here, you can see the status of the steps and, if necessary, determine at which step a failure has occurred.

Tasks tab

The Tasks tab includes the views and tools to search for, monitor, and manage the tasks associated with the automated services. The Tasks tab includes the Task, History, and Debug tabs.

From the Header control area at the top, you can enter a search string to look for a specific task. You also have the option of toggling To Do Filter or My Task to show only tasks that have been specified as TO DO or tasks that have been started by the current user. The default for these options is off. The following property information and descriptions are provided for tasks:

- Task Name: The name of the task.
- To Do: Displays tasks marked as "To Do."
- Status: The status of the task.

- Scheduled Time: Scheduled start time for the task.
- Start Time: Actual start time of the task.
- Completion Time: Completion time of the task.
- Schedule Type: Shows a task beginning immediately or on a defined schedule.
- Task ID: Unique ID assigned to the task.
- Description: User-specified description of the task.
- Service: Service that began the task.
- Service Group: Service group to which the service belongs.
- Tags: Tags associated with the task.
- Submitted By: Name of the user who submitted the task.
- Submit Time: Time when the service was submitted.
- Schedule Interval: Interval between recurring tasks.
- Recurrence Time: Time when a recurring task is to start.
- Schedule Start Date: Date and time when the recurrent schedule becomes effective.
- Notes: User-specified text/message.
- Step Start Time: Start time of the long-running step or the time the task started waiting for input.



Note: A subset of the most common details are shown by default depending on which tab (Tasks, History, or Debug) is currently selected. You can click the Column Settings tab to see all available detail options and to select the ones most useful for your environment.

Tag Search pane

The Tag Search pane enables users to filter tasks that have been tagged.

Tags are organized into groups, such as Applications, Service Groups, and Task Statuses. Each group has one or more tags.

To use tags, click a tag name to see only tasks tagged with that name in the Tasks pane. Click the tag again to expose all tags in that group and all tasks that were filtered out.

In the Service Group and Task Status tag groups, you can only use one tag at a time.

You can click Organize Tags to create your own tag groups and then add tags to the groups. You can also add tags to the provided groups.

The Information area under the task window shows icons for all the steps associated with a task and the current status.

Tasks

The Tasks tab enables users to do the following:

- View tasks and use tags to filter them.
- View tasks associated with released services on the Tasks tab, archived tasks on the History tab, and tasks generated from a service in debug, test, or maintenance status on the Debug tab.
- Click Input Response to enter information required by a task in Waiting for Input status.
- Select a task, then click Show Details to see the details of the task.
- Click More Actions to see other actions available to manage tasks.
- Suspend Schedules: Prevents a scheduled task from starting at the scheduled time.
- Resume Schedules: Allows a suspended task to start at the scheduled time.
- Cancel Schedules: Clears all schedules from the task.
- Stop: Stops a task in the In Progress, Waiting for Input, or Long Running status.
- Forcibly Stop: Stops a task in the In Progress, Waiting for Input, or Long Running, In Progress (with Error), or In Progress (Terminating).
- Retry the Task from the Failed Step: Tries to run the selected task from the point of failure.
- Retry the Task from the Step After the Failed Step: Tries to rerun the selected task after previous try has also failed.
- Create Similar Request: Runs a task that was previously in the Failed, Canceled, or Completed status.
- Archive: Moves one or more tasks to the History view.
- Mark as "To Do": Adds a flag to the To Do column as a reminder that action is needed.
- Unmark "To Do": Removes a flag from the To Do column.

History

The History tab includes tasks that have been archived from the Tasks tab. You can select tasks, then click Remove to permanently delete tasks.

Debug

The Debug tab displays tasks that are tasks generated from a service in debug, test, or maintenance status. This tab is available to users with the Modify (or higher) role. The Debug tab has the same actions as available for the Tasks tab, but also includes an option "Remove" for removing a task from the list.

About task status

After a task is generated from a service, the status changes as it runs. From the Tasks tab, you can view tasks by using tags and monitor the progress of the tasks based on their status.

The following table lists the most often used task categories, status, and the available actions.

Task category	Task status	Description	Available actions
Active	In Progress	Task is running.	Stop the task. Forcibly stop the task.
	Waiting for Input	Task is pending user input.	Stop the task. Forcibly stop the task.
	Long Running	Task is running longer than expected.	Stop the task. Forcibly stop the task.
	In Progress (with Error)	Task detected an error.	Stop the task. Forcibly stop the task.
	In Progress (Terminating)	Task is terminating.	Forcibly stop the task.
Scheduled	Waiting	Task is scheduled and waiting to run at the scheduled time.	Suspend the task. Cancel the task.
	Suspended	Task is scheduled, but will not run at the scheduled time.	Cancel the task. Resume the task.
	Canceled	Task is canceled.	Resubmit the task. Archive the task.
Finished	Completed	Task completed.	Resubmit the task. Archive the task.
	Failed	Tasks failed.	Try the task again from the failed step. Try the task again from the step after the failed step. Resubmit the task. Archive the task.

Other task tags are also available from the Task Status area to narrow down searches based on the status of a task.

Ops Center Automator can send email notifications to users when a task fails to run, or when a task requires input from a user to continue. The Admin role is required to set up email notifications.

Viewing task details

The detailed task information includes a summary, submit information, results from output properties, log, and notes. Detailed task information is available for active and test tasks. Detailed task information is not available for archived tasks.

On the Tasks tab, select a task from the Tasks or Debug view, then click Show Details.

The following controls are available:

- Input Response: Click to respond if a task is in Waiting for Input status.
- Archive: Click to archive the task.
- Mark as "To Do": Click to mark as To Do (red flag) to the task row in the Debug pane. This can be used if the task needs attention from an administrator.
- Unmark "To Do": Click to remove the flag.
- More Actions: Click to access additional options that affect the selected task.

The following table describes the task information that is provided in the **Task Details** window.

Property	Description
Summary tab	
Task ID	The auto-generated 16-digit identification number of a task.
Task Name	The name of the task.
Status	The current status of the task.
Description	The description of the task.
Service	Click the link to open the service preview, where you can view information about the service. Admin and Develop users can also access the Template Preview and the template flow in the Service Builder Edit view in Automator Service Builder.
Submitted By	Name of the user who submitted the service.
Schedule Type	The schedule type of a task, for example, Immediate indicates that the task is scheduled for immediate execution. Scheduled means that the task is scheduled for future execution.
Details	Details pertaining to the task.
Submit Time	Time when the service was submitted.
Start Time	The start time of the task.
Completion Time	Completion time of the task.
Submitted Data tab	Displays the parameters set for the task when submitted and can vary depending on the service.
Results tab	Displays the results of any output properties that were set.
Flow tab	Shows the flow of steps
Log tab	The log information might be useful in debugging. You can copy a section or save the entire log by clicking Download and then specifying the location of the log file.
Notes tab	An HTML text editor is provided to enter additional information regarding the task. For example, a user might need to add information that can be viewed by an administrator when assistance is needed with a task.

Responding to tasks

Some tasks might require input from a user to continue running (for example, a manager's approval) and might send an email notification indicating that a response is required. A task that is pending a response is in the Waiting for Input status.

Procedure

1. On the **Tasks** tab, select the task that needs a response, then click **Input Response**.
2. In the **Input Response** dialog box, input the response.
3. Click **OK**.

Suspending scheduled tasks

You can temporarily suspend tasks that are scheduled to run regularly or at specific times, provided that the task has not yet begun processing. Suspending tasks is useful during blackout periods for system maintenance. You can suspend tasks in the Waiting status.

Procedure

1. On the **Tasks** tab, select the task that you want to suspend.
2. Click **More Actions > Suspend Schedules**.
3. In the **Suspend** dialog box, click **OK**.

The task status changes to Suspended.

Resuming scheduled tasks

You can resume a task in the Suspended status. You can resume a suspended task to run based on the original schedule.

If you resume a schedule after the scheduled start time, the task is run immediately. If the original schedule of the task is in the past, then the task must first be canceled, then resubmitted.

Procedure

1. On the **Tasks** tab, select the task that you want to resume.
2. Click **More Actions > Resume Schedules**.
3. In the **Resume Schedules** dialog box, click **OK**.
If the scheduled start time is in the future, the status changes to Waiting.

Canceling scheduled tasks

You can cancel scheduled tasks that are in the Waiting status and the Suspended status. A canceled task cannot be resumed.

Procedure

1. On the **Tasks** tab, select the task that you want to cancel.
2. Click **More Actions > Cancel Schedules**.
3. In the **Cancel Schedules** window, click **OK**.
The task status changes to Canceled.

To resume a canceled task, you must resubmit the task.

Stopping tasks

To stop a service that is already running, you must stop the tasks generated from the service.

You can stop tasks that are in the In Progress status. A task that is stopped cannot be resumed. To restart a stopped task, you must resubmit the service that is associated with the task.

Procedure

1. On the **Tasks** tab, select the tasks that you want to stop.
2. Click **More Actions > Stop**.
3. In the **Stop Task** window, click **OK**.
The tasks stops and the status changes to **In Progress (Terminating)**.
4. (Optional) You can verify the point at which the task was stopped by selecting the task and viewing the task details.

Forcibly stopping tasks

To forcibly stop a service that has been executed, you must stop the tasks generated from the service.

You can forcibly stop tasks that are in the In Progress, Long Running, Waiting for Input, In Progress (with Error), and In Progress (Terminating) status. You enable the Forcibly Stop action in the Available Actions section of the **Create/Edit Service** window. A task that is stopped cannot be resumed. To restart the execution of a stopped task, you must resubmit the service that is associated with the task.

Procedure

1. On the **Tasks** tab, select the tasks that you want to stop.
2. Click **More Actions > Forcibly Stop**.
3. In the **Forcibly Stop Task** window, click **OK**.
The tasks stops and the status changes to **In Progress (Terminating)**.
4. (Optional) You can verify the point at which the task was stopped by selecting the task and viewing the task details.

Trying the task again from the failed step

You can try tasks again from the step that failed for tasks that are in the Failed status. You enable actions to try again in the Available Actions section of the **Create/Edit Service** window.

Procedure

1. On the **Tasks** tab, select the task that you want to try again from the step that failed.
2. Click **More Actions > Retry the Task From the Failed Step**.
3. In the **Retry the Task From the Failed Step** window, click **OK**.
The task runs from the failed step and the status tells you whether the task failed or succeeded.
4. If the task fails again, check the cause of the failure, take the required action, and then retry the task.

Retrying a task from the step after the failed step

When a task fails, you can debug and then try a task again from the step after a step that is in the Failed status. Retry actions are enabled in the Available Actions section of the **Create/Edit Service** window. When you select a single task to try again, ensure that the task is in Failed status.

Procedure

1. On the **Tasks** tab, select the task that you want to try again from the step after the failed step.
2. Click **More Actions > Retry the Task From the Step After the Failed Step**.
3. In the **Retry the Task From the Step After the Failed Step** window, click **OK**.
The task runs from the step after the failed step and the status tells you whether the task failed or succeeded.
4. If the task fails again, check the cause of the failure, take the required action, and then retry the task.

Creating a similar task request

You can resubmit tasks that are in the Completed, Failed, or Canceled status.

If a task failed because of a problem that is now resolved, or if the task was canceled, you can create a similar request without re-creating the settings. The new task has a new Task ID.

Procedure

1. On the **Tasks** tab, select the task you must resubmit. You can also begin this procedure from the **Task Details** window.
2. Click **More Actions > Create Similar Request**.

3. In the **Submit Similar Request** window, modify the settings, if required.



Note: In Task Settings, a specified schedule is interpreted as a server time. Be aware if the server is in a different time zone from the client.

4. Click **Submit** to submit the service, or **Submit & View Task** to view the tasks.

Archiving tasks

Ops Center Automator automatically archives tasks every 7 days, starting with the oldest run task. You can also manually archive tasks that are no longer active. The Admin, Develop, or Modify role is required to archive tasks.

You can archive a task in Completed, Failed, or Canceled status from the Tasks or Debug tabs. When you archive a task, it appears in the History tab. The task details are not visible for archived tasks, but the submission date and submit user information is retained. An archived task cannot return to the Task or Debug tabs.



Note: No new tasks are created when the total number of tasks exceeds 5,000.

Procedure

1. On the **Tasks** tab, from the **Task** or **Debug** tabs, select the tasks that you must archive.
2. Click **More Actions > Archive**.
3. In the **Archive** dialog box, click **OK**.
The task is moved to the **History** tab.

Deleting tasks from history

When you no longer must retain tasks for reference purposes, or if tasks created while testing a service template are no longer needed, you can delete tasks. You must archive a task before deleting it.

You can delete archived tasks from the History view. Archived tasks are also automatically deleted when the number of tasks exceeds 30,000 starting from the oldest task. A deleted task cannot be recovered.

Procedure

1. On the **History** tab, select the tasks that you must delete.
2. Click **Remove**.
3. In the **Remove** dialog box, click **OK**.

Chapter 5: Working with service templates

A service template is the starting point for creating a new service. Ops Center Automator has preconfigured service templates to assist in creating automation services. Configure these templates to meet your service needs.

Viewing service template information

The Admin, Develop, or Modify role is required to work with templates. The Service Templates tab displays only templates that have been released.

The Service Templates tab enables users to do the following:

- View and filter service templates with tags.
- Create custom tags or tag groups using Organize Tags.
- Using the Card View or Table View, see service template details, status, and actions.
- Create and edit templates.
- Manage service templates by toggling between views of all versions or the latest version.

Procedure

1. Click the **Service Templates** tab to view all released templates.
2. Choose a view:
 - Click **Card View** to open a graphical representation of templates. In this view, you can click a template to open the template preview, which includes detailed information and access to controls. **Card View** enables you to visualize your templates as discrete objects, and allows you to see the description in each template.
 - Click **Table View** to open a table with a list of templates. This view includes some fields that are not available in the **Card View**. You can add and delete fields from this view with the **Column Settings**.

Service Templates tab

Services are based on service templates. The Service Templates tab includes the views and tools to create, copy, import, organize, and manage automated service templates.

Tag Search pane

The Tag Search pane enables users to filter service templates that have been tagged.

Tags are organized into groups, such as Applications, Hypervisors, and Storage Operations. Each group has one or more tags.

To use tags, click a tag name to see only service templates tagged with that name in the service templates pane. Click the tag again to expose all tags in that group and all service templates that were filtered out. You can only use one Version tag at a time.

You can click Organize Tags to create your own tag groups and then add tags to the groups. You can also add tags to the provided groups.

Controls

The following actions are available in the Service Templates tab to manage service templates.

Control	Use
Show Latest Version Show All Versions	Choose to show only the latest versions or all versions of templates.
Card View	You can click a template to open the template preview, which includes detailed information and access to controls. Card View enables you to visualize your templates as discrete objects, and allows you to see the description in each template.
Table View	Table View lets you see more information at the same time, and makes it easy to compare information in your list. You can choose which columns to display and reset the defaults at any time. You can also rearrange columns in the table.
Import	Import a template to Ops Center Automator. This can be used to import a template from another environment.
Create	Start Service Builder to create a new service template. For more information, see the <i>Hitachi Ops Center Automator Service Builder User Guide</i> .
Create Service	Create a new service from the specified service template.
Copy and Edit	Start Service Builder to create a new service template based on the specified template. For more information, see the <i>Hitachi Ops Center Automator Service Builder User Guide</i> .
View Flow	Start Service Builder to view the flow of the template in the Service Builder Edit view. For more information, see the <i>Hitachi Ops Center Automator Service Builder User Guide</i> .
Export	Export a file and save it outside Ops Center Automator.

Control	Use
Delete	Delete an existing template.
Apply Latest Version	Apply the latest version of the template to the associated service.
Update Service Template	<p>If this control is available, the template is using an outdated version of another template or components. Use this control to update the template using Service Builder.</p> <p>For more information, see the <i>Hitachi Ops Center Automator Service Builder User Guide</i>.</p>

Properties

The following properties are available in the Service Templates tab for each template:

- Name: Name entered by the vendor or user.
- Template icon: Icons represent different types of templates.
- Vendor ID: Vendor identifier.
- Version: Version number of the template.
- Description: Description of the template.
- Service Template Key Name: Identifier name of the template.
- Vendor: Template vendor.
- Tags: Tags applied to the template.
- Registered (in Table View): Date the template was created.
- Released (in Card View): Date the template was released.
- Updated (Last Update in Card View): Date and time the template was last updated.
- Latest Version (in Table View): Whether the template is the latest version. In Card View, an outdated template has an OUTDATED badge.
- Used Services: Number of services using the template. Click to open the Table View of the Services tab with services using the template.
- Used Service Templates (in Table View): Number of templates using the template. Click to open the Templates using the template dialog box where you can select a template, then click View Flow to open the flow window for the template.
- Services Outdated: Whether any services are using an outdated version of the template. In Card View, the template has a NEED VUP badge.
- Component Outdated (in Table View): Template includes outdated components.

Graphic properties in the Card View

The Card View includes the following graphic signals.

Graphic	Description
NEED VUP	A service is using an outdated template. You can use Apply Latest Version to apply the latest template.
OUTDATED	The template is using an outdated version of another template or components. You can use Update Template to update the template version.
NEW	The template is fewer than 14 days old.
[blue dot]	The template is used by services.

Importing a released service template

Admin and Develop users can import service templates to Ops Center Automator.

You must export and import templates if you are using two different Ops Center Automator environments. Service templates that are built and released in the test environment must be exported and then imported to the production environment.

All templates that are provided with Ops Center Automator are ready to use in the Services Templates tab. In addition, all templates that are released from Service Builder appear in the Service Templates tab.

Procedure

1. In the **Dashboard Guidance Menu** select **Import Service Template** or from the **Service Templates** tab click **Import** to open the **Import Service Template** window. You can also import a service template from the **Card View** by clicking **Import**.
2. Browse to the template file with the file extension `.st`, or the template set `.zip` file, then click **OK**.
The template is added to the Service Templates tab with a "NEW" badge in the **Card View**. You can use it to create services.

If the selected file does not satisfy the following conditions, an error dialog box is visible and the import is canceled:

- The file name must be 127 characters or less in length.
- The file name must not contain multibyte characters.
- The service template set (`.zip` format) to be imported must contain templates (with the extension `*.st`).



Note: The files in the service template set are not verified. If the service template contains a service plug-in, the import result of the service plug-in is not visible.

Creating a service from the Service Templates tab

Admin, Develop, and Modify users can create services from either predefined service templates or custom service templates, or modify information in an existing service to satisfy specific needs.

Procedure

1. On the **Service Templates** tab, click the service template you want to use to open the service template preview.
2. In the service template preview pane, click **Create Service** to open the **Create Service** window.
3. In the **Create Service** window, in the **Settings** pane, enter the following information, which is summarized in the **General Settings** area of the **Navigation** pane:
 - Name of the service.
 - Description of the service.
 - **State**: Select **Test** for new services to allow only users in the Admin, Develop, or Modify role to submit the service.
 - **Tags**: Specify one or more tags for the service (to a maximum of 256 characters). The tags you select for the service also apply to the tasks generated by the service.
 - **Service Group**: Select the service group of users who can access the service.
 - **Template**: The template on which the service is based. Click the template name to open the **Template Preview**, which includes detailed information about the template.

In the **Template Preview**, you can click **View Flow** to open the flow window for the template.
4. Expand **Advanced Options** and select the options you want:
 - Scheduling Options:
 - Immediate**: Run the service when it is submitted.
 - Scheduled**: Run the service one time.
 - Recurrence**: Run the service multiple times.
5. In the **Navigation** pane, click each settings group and configure the required and optional parameters. You can also navigate through the settings groups using the links at the bottom of the Settings pane.
6. After configuring the settings, do one of the following:
 - Click **Preview** to open a view of the service as it appears to a user. Then click **Save and Close** to save the service.
 - Click **Cancel** to close the window without saving any changes.

Next steps

Test the service if you created it in Test state.

Exporting a service template

Admin and Develop users can export templates from Ops Center Automator.

You might need to export templates in the case where there are two separate Ops Center Automator environments. Templates from one environment can be exported and then imported to the other environment.

Procedure

1. On the **Service Templates** tab, select a template and in the **More Actions** menu, click **Export**.
2. Click **OK**.
3. Choose a location and enter a name for the file.
The service template is exported to the location you specified.

Deleting a service template

Admin and Develop users can delete a service template. You can only delete templates that are not used by services or other templates.

Procedure

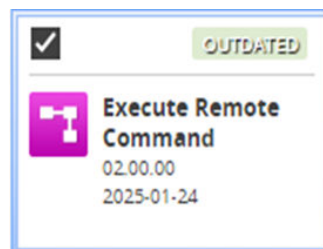
1. On the **Service Templates** tab, select a service template.
2. Click **More Actions > Delete**.
3. Confirm your choice.
The template is no longer in the **Service Templates** tab and you cannot create a service from the template.

Updating a service template version

Admin, Develop, and Modify users can update the version of a template.

If a template has changed, you might need to update the version in the Service Templates tab.

Templates that are outdated have an "OUTDATED" label in the Card View.



In the Templates tab, click Card View, then click the template you must update to open the **Copy Service Template** dialog box in Service Builder.

For more information, see the *Hitachi Ops Center Automator Service Builder User Guide*.

About provisioning service templates

Ops Center Automator provisioning templates automate the provisioning of newly added volumes and existing volumes. The provisioning templates provide the intelligence based on industry best practices to target resources and select volumes to improve storage load balancing. Pools are selected based on the storage profiles and infrastructure groups assigned to the service.

The provisioning templates are designed to provide the following features:

- Automate the provisioning tasks across multiple storage systems to reduce the amount of time to configure each provisioning request manually.
- Run provisioning services immediately or at a scheduled date and time.
- Assign provisioning services to specific users and service groups so users can run services independently of an administrator.
- Customization to meet specific functional needs and storage needs.

Ops Center Automator has the following provisioning service templates that creates volumes and allocates them to the specified hosts. You can locate the templates and services that are created by these templates by using the Add New Storage tag and the tag of the host type.

Allocate Fabric Aware Volumes with Configuration Manager

Allocates sets of volumes from the associated infrastructure group through Ops Center API Configuration Manager for use with servers running a generic application. This service can optionally configure zoning of the allocated paths and you can view new and modified zoning information such as the following:

- General zone information
- Zone alias information
- Zone configuration information

Allocate Volumes with Smart Provisioning

Intelligently allocates sets of volumes from the associated infrastructure group through Ops Center API Configuration Manager for use with servers running a generic application. This service can optionally configure zoning of the allocated paths and you can view new and modified zoning information such as the following:

- General zone information
- Zone alias information
- Zone configuration information

You can watch a [video](#) on how to use this service template.

Allocate Volumes with 2DC Remote Replication

Intelligently allocates sets of volumes from the associated infrastructure group through Ops Center API Configuration Manager for use with servers running a generic application and creates a new topology for remote replication. This service can

optionally configure zoning of the allocated paths and you can view new and modified zoning information such as the following:

- General zone information
- Zone alias information
- Zone configuration information

Allocate Volumes with Remote Replication (Global-Active Device)

Allocates sets of volumes with in-system replication (global-active device) from the associated infrastructure group through Ops Center API Configuration Manager for use with servers running a generic application. This service can optionally configure zoning of the allocated paths and you can view new and modified zoning information such as the following:

- General zone information
- Zone alias information
- Zone configuration information

About ESX cluster service templates

The Ops Center Automator ESX cluster service templates enable you to allocate volumes to VMware ESX cluster hosts, configure zoning, and create a VMware Datastore under a Datastore cluster. You can also remove a host from a vCenter cluster.

Allocate Fabric Aware Volumes and Create Datastore for ESX Cluster

Enables you to allocate volumes to VMware ESX cluster hosts, configure zoning, and create a VMware datastore under a datastore cluster.

Add Host to Cluster in vCenter

Enables you to allocate existing volumes used as datastores by ESX cluster hosts to a new ESX host.

Remove Host from Cluster in vCenter

Enables you to unmount VMFS datastores, unallocate volumes from the specified ESX host, and delete zoning.

About ESXi host service templates

The Ops Center Automator ESXi Host service template enables you to allocate volumes to the VMware vSphere server (ESXi host), configure zoning, and create VMware datastores under a datastore cluster.

Allocate Volumes, Fabric, and Datastore for ESXi Host

Enables you to allocate volumes to the ESXi host, configure zoning, and create VMware datastores under a datastore cluster.

About ServiceNow ticketing service templates

Ops Center Automator ServiceNow ticketing service template components enable you to combine different ticketing functionality to create different types of services for processing ServiceNow workflows that include running an Ops Center Automator automation service.

You can watch a [video](#) about using Ops Center Automator with ServiceNow. The interface might be slightly different, but the steps are the same.

The following Ops Center Automator ServiceNow ticketing service templates are part of the software and are preconfigured:

- Call ServiceNow Table API

This service template makes a call to the ServiceNow Table API.

- Create ServiceNow Incident Ticket

This service template creates a new ServiceNow incident ticket.

- Update ServiceNow Incident Ticket

This service template updates a ServiceNow incident ticket.

- Retrieve ServiceNow Incident Tickets

This service template retrieves a single ServiceNow incident ticket or a group of incident tickets.



Note: For information about the ServiceNow Workflow Integration package that has an XML file containing the update set required to integrate an Ops Center Automator service into a ServiceNow workflow, see [ServiceNow workflow integration \(on page 113\)](#).

About global-active device

Global-active device (GAD) enables you to create and maintain synchronous, remote copies of data volumes. A virtual storage machine is configured in the primary and secondary storage systems using the actual information of the primary storage system, and the global-active device primary and secondary volumes are assigned the same virtual LDEV number in the virtual storage machine. This enables the host to see the pair volumes as a single volume on a single storage system, and both volumes receive the same data from the host. A quorum disk, which can be located in a third and external storage system or in an iSCSI-attached host server, is accessed by both storage systems and is used to monitor the pair volumes for any communication failure.

Ops Center Automator includes a Global-Active Device Setup service template that enables you to automation a portion of the GAD setup process. In addition, a number of other service templates support global-active device (GAD) configurations. GAD enables read/write copies of the same data in two places at the same time for continuous mirroring. Ops Center Automator supports three GAD configurations:

- Single-server configuration
- Server-cluster configuration
- Cross-path configuration

Cross-path suppression

If the distance between the primary site and the secondary site is long, I/O using the cross-path causes overhead. Suppress I/O of the cross-path by setting ALUA (Asymmetric Logical Unit Access) or HMO (Host Mode Option).

Additional cross-path suppression problems

- If the Alternate path software supports ALUA (Asymmetric Logical Unit Access), suppress the cross-path by setting ALUA to the preferred path.
- If the Alternate path software does not support ALUA, you cannot suppress cross-path.
- If you are using Dynamic Link Manager (HDLN), suppress the cross-path by setting a nonpreferred path to the HMO.

About the Global-Active Device Setup service template

The Global-Active Device Setup service template enables you to automate portions of the GAD setup process. Using this template, you can set up some of the basic requirements the first time you use the template and then skip those steps whenever you use template again. You can then use the GAD configuration for any purpose and a prerequisite for using the Online Migration service template.



Note: For additional information on GAD, see the *Global-Active Device User Guide*.

Setting up GAD consists of several steps. However, many of the steps are now automated when you use the Ops Center Automator Global-Active Device Setup service template. For step-by-step instructions for setting up GAD before using the Online Migration service template or for any other purpose, go to [Setting up global-active device \(on page 293\)](#).

About online migration service templates

You can now use Hitachi Ops Center Automator for Nondisruptive Data Migration (NDM).

You can watch a [video](#) on how to use these service templates.

The following online migration service templates are available:

Create Online Migration Pair

Enables you to run a service from the creation of zones to the creation of copy pairs for online host migration through Configuration Manager. After this service is complete, you must submit the Migrate Data for Online Migration Pair service to complete the migration.

Migrate Data for Online Migration Pair

Enables you to run a service from the swap of copy pairs to the deletion of source volumes for online host migration through Configuration Manager. Before submitting this service, the Create Online Migration Pair service must be completed.

Clean up Online Migration Pair

Enables you to clean up the resources created by the Create Online Migration Pair task.

Create Online Migration Pairs for Multiple Hosts

Enables you to submit a Create Online Migration Pair service task for each specified host. After the auto-submitted tasks are complete, you must submit the Migrate Data for Online Migration Pair service for each task to complete the migration.

The Ops Center Automator online migration services use Global-active device (GAD) (as part of, or to complete) the migration process.

- For step-by-step instructions for setting up GAD before using the Online Migration service template or for any other purpose, go to [Setting up global-active device \(on page 293\)](#).
- If you already set up GAD, and want to use the online migration templates, go to [Migrating online data with Configuration Manager \(on page 308\)](#), [Create Online Migration Pair: Service details \(on page 312\)](#), and [Migrate Data for Online Migration Pair: Service details \(on page 341\)](#).



Note: You cannot use the Create Online Migration Pair service template's Capacity Saving function with the following features:

- Page reservation for virtual volumes
- Active flash
- Direct Data Mapping (DDM) attribute
- ShadowImage quick restore

Chapter 6: Administering Ops Center Automator

This module describes Ops Center Automator administrative tasks.

Viewing the Administration tab

The Administration tab includes the views and tools to set up and configure Ops Center Automator. It includes the necessary connection settings to other hosts and third-party products, and the tools to set up users, groups, permissions, and relationships, as follows:

- Create agentless remote connections to register hosts and, if necessary, set up the Web Services Connections.
- Manage properties shared among the services under Shared Properties Settings.
- View and configure groups:
 - Based on roles (Submit, Modify, Develop, and Admin) and permissions (user management).
 - By service groups.
 - By infrastructure groups.
- View and manage users.
- Set up external resource providers that can supply data for evaluating and executing input and output properties.

Setup workflow with Common Services authentication

The first time you log on to Ops Center Automator through Hitachi Ops Center, you must do the following setup steps.

Procedure

1. Log on to Common Services.
Use the built-in system account to log on to Common Services for the first time and change the system account password.
2. Register a license.
After logging on to Common Services, you must register a valid license.

3. Set up users and user groups.
You must have Ops Center Security Administrator permissions to add and assign users to user groups in Ops Center. See the *Hitachi Ops Center Online Help* for more information.
4. Configure Web Service Connections.
Register and manage connection information to Configuration Manager instances, vCenter connections, Brocade Network Advisor connections, and so on.
5. Configure agentless remote connections.
Set up agentless remote connections and register connection-destination hosts.
6. Set up infrastructure groups.
Create infrastructure groups and assign web service connections, agentless remote connections, and service groups.
7. Set up service groups.

Setup workflow with local user authentication

After installing Ops Center Automator, you must perform some initial setup tasks to configure the system.

To set up the product, make sure you have the Admin role in Ops Center Automator.

The following steps summarize the initial setup workflow:

1. Register a license.
Before you can log on to Ops Center Automator, you must register a valid license.
2. Log on to Ops Center Automator.
Use the built-in system account to log on to Ops Center Automator for the first time. Change the system account password.
3. Configure Web Service Connections.
Register and manage connection information to vCenter connections, Brocade Network Advisor connections, and so on.
4. Configure agentless remote connections.
Set up agentless remote connections and register connection-destination hosts.
5. Set up users and user groups.
Ops Center Automator users are automatically registered through the Common Services. The Admin role in Hitachi Ops Center with the user management permission is required to add and assign users to user groups in Ops Center Automator. A user must belong to at least one user group.
6. Set up infrastructure groups.
Create infrastructure groups and assign web service connections, agentless remote connections, and service groups.
7. Set up service groups.

Managing groups in Ops Center Automator

Ops Center Automator has several types of groups to organize and manage access to services and resources. You must build relationships between user groups, service groups, and infrastructure groups to run the automated services.

- **User groups:** A user group is a set of users in Ops Center Automator who share the same level of access.
- **Service groups:** A service group is one or more services in Ops Center Automator. A service group can be assigned to a user group to control access to services in the service group.
- **Infrastructure groups:** An infrastructure group is a set of web service connections, and agentless remote connections in Ops Center Automator. Infrastructure groups are assigned to service groups to manage the resources available to the service.

About user groups

A user group is a set of users in Ops Center Automator who share the same level of access. User groups are used in combination with service groups to manage a user's level of access. A user must belong to at least one user group and can belong to multiple groups. You can use the predefined user groups, or create a new user group. User groups can be created by an administrator in the Admin role with the user management privilege.

The built-in user groups that are automatically created when Ops Center Automator is installed cannot be modified. Although other built-in user groups that correspond to the roles of the other Common Component products are created with them, a user can use only the following user groups.

These predefined user groups are only provided with Automator. To use them for Hitachi Ops Center, you must create them. See the *Hitachi Ops Center Online Help* for more information.

- **AdminGroup:** has administrative privileges over all of Ops Center Automator.
- **ModifyGroup:** intended for expert users to modify existing services in service groups where permission is assigned.
- **SubmitGroup:** intended for service users who perform the submit service procedure.
- **DevelopGroup:** intended for users who create or modify templates.

Creating a user group

The Admin role with the user management privilege is required to create user groups.

This topic describes how to create a user group using Automator. To create them for Ops Center, see the *Hitachi Ops Center Online Help*.

Procedure

1. On the **Administration** tab, click **Resources and Permissions > User Groups**.
2. Click **Create** and enter the name and description of the user group.
3. Click **OK**.

About service groups

Service groups manage the access and permissions to a service and the storage needs of the service. A user gains access to a service through a service group. Infrastructure groups are assigned to service groups to manage the resources available to the service. A service group must contain at least one user group and one infrastructure group.

Three types of service groups are available:

- **All Service Group:** A group that is automatically created during installation. Pre-defined user groups (AdminGroup, DevelopGroup, ModifyGroup, and SubmitGroup) are automatically registered in the All Service Group. This group cannot be associated with a specific service, agentless connection, or infrastructure group. The All Service Group cannot be modified or deleted. User groups associated with All Service Group also have privileges in other service groups. These user groups are indicated with an asterisk (*) after the user group name.
- **Default Service Group:** A group that is automatically created during installation. All built-in services belong to this group and cannot be deleted.
- **General Service Group:** Custom service groups that can be created by users and associated with services. Only users with the Admin role can create service groups. The Modify role (or higher) is required to assign a service to a service group.

Creating a service group

Admin users can create service groups.

Procedure

1. On the **Administration** tab, navigate to **Resources and Permissions > Service Groups**.
2. Click **Create** and enter the name and description of the service group.
3. Click **OK**.

Next steps

Edit the service group to associate it with services, infrastructure groups, and user groups.

Viewing service groups

The service group view lists all the service groups and their associated services, infrastructure and user groups. The service groups can be viewed from the Administration tab under Resources and Permissions > Service Groups. From the views, you can establish the relationship of a service group to services, infrastructure groups, and user groups.

For each service group, the view displays the following information:

- **No. of Services:** The number of services in the service group.
- **No. of Infrastructure Groups:** The number of associated infrastructure groups.
- **No. of User Groups:** The number of user groups with access to the service group.

Click a service group to view the details under each tab:

- **Services tab:** The associated services.
- **Permissions tab:** The associated user groups and their roles.

Click **Assign** to assign or remove user groups.

Click a user group name to open the User Groups page.

Assigning services to a service group

You can give access to a service by assigning a service to a service group. Admin users can assign a service to a service group.

Procedure

1. On the **Administration** tab, click **Resources and Permissions > Service Groups**.
2. Select a service group to display the **Services**, **Resources**, and **Permissions** tabs. Use **Create** or **Copy** to add a new service.
3. In the **Create Service** window, click **Save and Close** and update the Service Groups pane to view the service.

Assigning a user group to a service group

Manage the access to a service by assigning user groups to a service group. The UserMgmt permission is required.

You must have Ops Center Security Administrator permissions if you assign a user group to service group through Hitachi Ops Center.

Procedure

1. On the **Administration** tab, click **Resources and Permissions > Service Groups**.
2. Select a service group and on the **Permissions** tab, click **Assign**.
3. From the **Assign User Groups** view, select a user group from the available user groups, then click **Add**. Select a **Role** from the available options.
The selected user group is moved to the assigned user groups.
4. Click **OK**.

About infrastructure groups

Infrastructure groups manage the relationship between service groups and resources. Infrastructure groups are assigned to service groups to manage the resources available to the service. A service group must contain at least one infrastructure group.

Creating an infrastructure group

Admin users can create infrastructure groups.

Before creating an infrastructure group, you must be aware of the access boundaries for storage resources. Resources within an infrastructure group will be accessible by associated service groups.

Procedure

1. On the **Administration** tab, click **Resources and Permissions > Infrastructure Groups**.
2. Click **Create** and enter the name and description of the infrastructure group.
3. Click **OK**.

Next steps

Assign the Web Service Connections, Agentless Remote Connections, and Service Groups.

Viewing infrastructure groups

The infrastructure group view lists existing infrastructure groups and enables you to create new infrastructure groups that you can assign to Web Service Connections, Agentless Remote Connections, and Service Groups. The infrastructure groups can be viewed from the Administration tab under Resources and Permissions > Infrastructure Groups. From the views, you can establish the relationship to service groups.

Infrastructure Groups

For each infrastructure group, the view displays the following information:

- **Name:** Name of the infrastructure group.
- **Description:** Description of the infrastructure group.
- **No. of Web Service Connections:** The number of associated web service connections.
- **No. of Agentless Remote Connections:** The number of associated agentless remote connections.
- **No. of Service Groups:** The number of associated service groups.

Click an infrastructure group to view the details under each tab:

- **Web Service Connections tab:** a list of associated web service connections for Ops Center API Configuration Manager. The following web service connection properties are provided.

- **Name:** Name of the web service connection.
- **No. of Connections:** The number of the web service connections.

By clicking ConfigurationManager, you can get specific details, and if necessary, assign an infrastructure group:

- **Category:** ConfigurationManager connections.
- **Name:** Name of the connection.
- **IP Address/Host Name:** IP address or Host Name of for the connection.
- **Port:** Port associated with the connection.
- **Protocol:** Protocol used by the connection.
- **User ID:** User ID for the connecting user.
- **Connection Status:** Indicates whether the connection is active or not.
- **Connected Time:** Shows when the current connection became active.
- **Proxy:** Shows any proxy associated with the connection.

- **Agentless Remote Connections tab:** a list of associated agentless remote connections. The following agentless remote connection properties are provided.

- **Method:** Method to specify the connection destination.
- **IP Address/Host Name:** IP range or host name of the connection destination.
- **Protocol:** Protocol used by the connection.
- **User ID:** User ID for the connection destination.
- **Connection Status:** Status of the connection.
- **Connected Time:** Time of last connection try.

- **Services Group tab:** a list of associated services.

The following service group properties are provided:

- **Name:** Service group display name.
- **Description:** Description for the service group.

Assigning resources to an infrastructure group

Select the resources associated with the infrastructure group.

Procedure

1. On the **Administration** tab, click **Resources and Permissions > Infrastructure Groups**.

2. From the **Infrastructure Groups** view, click the infrastructure group for which the resource is to be assigned. If necessary, you can create a new infrastructure group or edit an existing one.
3. From the **Web Service Connection**, **Agentless Remote Connections**, or **Service Groups** tab, choose the resource and then click **Assign** to assign to the infrastructure group.

Assigning service groups to an infrastructure group

You can add service groups associated with the infrastructure group.

Procedure

1. On the **Administration** tab, click **Resources and Permissions > Infrastructure Groups**.
2. On the **Service Groups** tab, click **Assign**.
3. From the **Assign Service Groups** dialog box, select a service group from the available service groups, then click **Add**.
The selected service group is moved to the assigned service groups.
4. Click **OK**.

Managing your user profile

You can view and modify your own user profile.

This topic describes how to manage your own user profile using Automator. To do this with Ops Center, see the *Hitachi Ops Center Online Help*.

Viewing your user profile

Admin users can view and edit their profiles from the Administration tab.

The **User Profile** window shows your User ID, Full Name, E-mail, Description, and the permissions assigned for each application.

Procedure

1. On the **Administration** tab click **User Profile** to access your user profile.
2. From the **User Profile** window, you can:
 - Edit your profile by clicking **Edit Profile**.
 - Change your password by clicking **Change Password**.

Changing your own password

As your password expires or is compromised, it must be changed.



Note: This task is for changing your local Automator password. To change your Hitachi Ops Center password, see the *Hitachi Ops Center Online Help*.

Procedure

1. On the **Administration** tab, click **User Profile**.
Your information is visible.
2. Click **Change Password**.
3. Type the new password and verify it.
4. Click **OK**.
5. Log on with your new password.


Editing your own user profile

As your role changes in Ops Center Automator, you can edit your user profile.

Procedure

1. On the **Administration** tab, click **User Profile**.
2. Click **Edit Profile**.
3. Edit the profile information as required and then click **OK**.
4. Confirm that the updated user profile information appears in the **User Profile** area in the **User Profile** window.

Managing users and permissions

Admin users can view and modify user profiles and permissions. Other users can modify the user profile and password by clicking the User icon () and selecting User Profile.

This topic describes how to manage users and permissions using Automator. To do these things with Ops Center, see the *Hitachi Ops Center Online Help*.

About user roles

The user role determines what a user can see, access, and perform in Ops Center Automator. User roles are assigned when assigning a user group to a service group. The following table describes the four roles in Ops Center Automator.

Role	Access level description	Included privileges
Admin	This level of access is intended for administrators to: <ul style="list-style-type: none"> ▪ Manage users and user groups ▪ Manage storage systems ▪ Customize services ▪ Import service templates 	<ul style="list-style-type: none"> ▪ Edit Service dialog box ▪ Submit Service dialog box ▪ Task Details dialog box ▪ All features on the Administration tab ▪ All features on the Service Templates tab.

Role	Access level description	Included privileges
Develop	This level of access is intended for expert level users to: <ul style="list-style-type: none"> Create and edit service templates using Service Builder Test service templates and services created from templates 	<ul style="list-style-type: none"> Access to Service Builder
Modify	This level of access is intended for expert level users to: <ul style="list-style-type: none"> Edit services Submit services Create services from templates 	<ul style="list-style-type: none"> Edit Service dialog box Submit Service dialog box Task Details dialog box Service Templates tab
Submit	This level of access is intended for service users to: <ul style="list-style-type: none"> Submit services Schedule services Monitor and resubmit tasks 	<ul style="list-style-type: none"> Submit Service dialog box Task Details dialog box

Viewing users

Admin users can add users, edit user profiles, and change passwords.

Access a list of users from the Administration tab. Navigate to Resources and Permissions > Users and Permission, then click Users in the **Users and Permissions** window.

Click a User ID in the list to view user profile details.

Creating a user account

All users not allowed to log on with the System account need a user account to access Ops Center Automator.

A user account consists of general user profile information (User ID, Password, Full Name, E-mail, and Description).

Procedure

1. On the **Administration** tab, click **Users and Permissions**.
A user management window opens.
2. Display the current user list by clicking **Users**.

3. To add a user, click **Add User** and specify user profile information.
4. Click **OK**.

Result

The user list opens again and includes the new user.

Editing the profile for a user account

You can modify the name, email address, and description for a user account.

Procedure

1. On the **Administration** tab, click **Users and Permissions**.
A user management window opens.
2. Click **Users**, select the target user by clicking the **User-ID** link, and click **Edit Profile**.
3. Edit the profile information for the user, and then click **OK**.
4. Confirm the updated user profile information.

Viewing permissions

Admin users can view and change permissions for other users.

Access a list of users from the Administration tab. Navigate to Resources and Permissions > Users and Permission, then click Permissions in the **Users and Permissions** window to view the number of registered applications, registered users, and the names of the applications along with their hosts or IP addresses and the number of authorized users for each application.

You can click an application name to view a list of users authorized for the application.

You can click a user name in the Authorized User List to view the user profile and all permissions.

Changing permissions for a user account

This section shows how to grant a user new permissions or remove existing permissions, change permission settings in the user account.

Procedure

1. On the **Administration** tab, click **Users and Permissions**.
A user management window opens.
2. Click **Users**, select the target user by clicking the **User-ID** link, then clicking **Change Permission**.
3. Edit the permissions, then click **OK**.
4. Verify the correct user permissions are selected.

Changing the lock status of user accounts

An Administrator can lock and unlock a user account.

Procedure

1. On the **Administration** tab, select **Users and Permissions**.
A separate user management window appears.
2. Click **Users**, and select the check box for the user whose lock status you must change.
3. Click **Lock Users** or **Unlock Users**.
4. Click **OK** to verify the lock status change, or click **Cancel**.
5. Verify the user account lock status.
 - If you locked the account, a lock icon appears next to the user account.
 - If you unlocked the account, ask the previously locked user to verify that they can log on.

User ID and password policies

User IDs and passwords must adhere to specific needs.

Ops Center Automator User IDs and passwords have the same needs:

- Number of characters: 1-256.
- Characters allowed: A-Z, a-z, 0-9 ! # \$ % & ' () * + - . = @ \ ^ _ | .

If you are using external authentication servers such as LDAP, note that User IDs and passwords must be valid for the external authentication server and Common Component products.



Note: If you are using external authentication servers with Common Services, see "About linking to an external authentication server" in the *Hitachi Ops Center Automator Installation and Configuration Guide*.

Configuring external authentication for users

External authentication systems can be used to authenticate user logons.

External authentication systems, such as LDAP (for example, Active Directory), RADIUS, or Kerberos can be used to authenticate Ops Center Automator users as they log on. You can reconfigure existing accounts, or create new accounts to use external authentication.

Before you begin

- The Ops Center Automator server must be linked to an external authentication server. See the *Hitachi Ops Center Automator Installation and Configuration Guide*.
- The Ops Center Automator server must be configured to support user authentication, which activates Change Auth in the UI, and gives authentication options such as Internal for a local account or LDAP for external authentication.
- The Ops Center Automator user ID must exist on the external authentication server. User ID information should be acquired from the external authentication server administrator before creating accounts.

**Tip:**

Set permissions or roles so that the registered user can complete necessary tasks by using Ops Center Automator products. Also consider adding user accounts to user groups with assigned roles for controlled access to resources.

Procedure

1. From the **Administration** tab, select **Users and Permissions**.
2. Select the **Users** folder, then select one or more users for which you want to change the authentication method, or click **Add User** to create a new account.

**Note:**

When creating a new account, only the **User ID** is required for external authentication, and must match a user ID on the external authentication server. For a local (internal) account, both a **User ID** and **Password** are required. When external authentication is available, new user accounts created without a password value are automatically configured to use external authentication (for example, LDAP is selected for you). Fill in the fields as needed, then click **OK** to create the user account.

If you are completing an external authentication in a multiple-domain configuration or by using realms, specify a user ID that includes the domain name or realm name for the **User ID**. Example: *user-name@domain-name* or *realm-name*.

When you log on, also specify your user ID in this format.

3. If you are selecting existing users, click **Change Auth**. A dialog box appears. From the list, select the required authentication method (for example, LDAP), then click **OK**.
4. Review the **Authentication** column to verify the authentication method.

Result

On the next logon try by each user, the user's logon credentials (user ID and password) are validated by using the external authentication server.

Configuring external authentication for groups

You can use external authentication systems to authenticate user groups.

You can use external authentication systems, such as LDAP (for example, Active Directory), RADIUS, or Kerberos to authenticate Hitachi Ops Center user group members as they log on. You can configure one or more user groups, from one or more external authentication servers.

When linking with an external authentication server, if using together with Active Directory as an external authorization server, you can manage user permissions by using the Active Directory groups (authorization groups) registered on the external authorization server. In this case, user permissions are specified for each group.

Before you begin

- The Ops Center Automator server must be linked to an external authentication server. See the *Hitachi Ops Center Automator Installation and Configuration Guide*.
- The Ops Center Automator server must be configured to support group authentication, which activates the Groups folder in the UI.
- The Ops Center Automator user group must exist on the external authentication server. The required domain and group information should be acquired from the external authentication server administrator.

Procedure

1. From the **Administration** tab, select **Users and Permissions**.
2. Click the **Groups** folder to display the **Domain List**. This is a list of external authentication servers listed by domain name, and host name or IP address. If the **Groups** folder is not visible, see the previous prerequisites.
3. Select the required **Domain Name** to show the **Group List**, which might be empty ("No Groups" appears). Click **Add Groups**.
4. Enter the **Distinguished Name** for the group. Use **Check DN** to verify a correct DN entry. Click **OK** to save your group and view the **Group List** again. The **Group Name** is derived from the entered DN. To specify multiple groups, note that:
 - You can add multiple DNs at the same time using the "+" button
 - If multiple DNs are listed, you can remove an entry with the "-" button
 - **Reset** clears all DN entries
5. From the **Group List**, click the **Group Name** link, then click **Change Permission** and set the Ops Center Automator permissions for the group (repeat this for each new group).
Your groups are now visible in the **Administration** tab **User Groups** folder.
6. (Optional) You can associate the groups with resources and roles, just as you can do with Ops Center Automator user groups. If you delete external authentication groups from **Users and Permissions** later, the groups are also removed from the **User Groups** list.
7. (Optional) To delete registered authorization groups, select the check boxes of the groups to delete, and then click **Delete Groups**.

Result

On the next logon try by each group member, the user's logon credentials (User ID and Password) are verified using the external authentication server.

Deleting users

If a user is no longer using Ops Center Automator, you can delete the user account. Admin users with User Management permission can delete users.

Procedure

1. On the **Administration** tab, click **Users and Permissions**.

2. In the **Users and Permissions** pane, click **Users**.
3. Select the user you want to delete.
4. Click **Delete Users**.
5. In the **Delete Users** window, click **OK**.

Configuring connection settings


Configuring Ops Center Automator needs setting the connection information to the Ops Center API Configuration Manager, other hosts, and third-party tools.


Configuring Web Service Connections


You can add or edit a web service connection.

Procedure

1. From the **Administration** tab, click **Connection Settings > Web Service Connections**.
2. Click **Add** or **Edit** and enter the following:
 - **Category**

 **Note:** When using a service that links with the FC switch management service, select **BNA**, **DCNM**, or **FOS_PrimarySwitch** as the category.
 - **Name**

 **Note:** When using a service that links with the FC switch management service, enter the same name as the input value of "Connection Names" or "Connections" for the service.
 - **IP Address/Host Name**
 - **Protocol**

 **Note:** When you use https with Web Service connections, you must first import certificates for the Web Service Connection and import certificates into the Java truststore. For detailed information, see the *Hitachi Ops Center Automator Installation and Configuration Guide*.
 - **Port**
 - **User ID**
 - **Password**
3. To use a proxy server, select the **Use Proxy Server** check box and enter the following information:
 - IP Address/Host Name
 - Port
 - Authentication

- Authentication Type
- User ID
- Password



Note: You can change the password in the **Edit** window once the web service connection is added.

4. Enter assigned infrastructure groups.
5. (Optional) You can test the connection with the values you specified by clicking **Test**. After starting the test, a notification balloon appears above the **Test** button indicating whether the connections completed successfully. To stop the testing process, click **Stop Test**.
6. Click **OK**.



Note: You can verify the status of the current connections from the **Web Service Connections** window, which shows the status (Successful, Error, and Unknown) and the time when the connection was last established. To update the display of current connection, click **Refresh**.

Configuring Ops Center API Configuration Manager connections

You must create a connection setting for the server running the Ops Center API Configuration Manager.

This connection enables Ops Center Automator to run services on storage systems registered with the Ops Center API Configuration Manager. Setting up connections requires the Admin role.

Before you begin

Before you can use services that use Configuration Manager, you must set up your environment so that the Ops Center API Configuration Manager manages all of your storage systems. For detailed information on setting up this environment and registering your storage systems with a Ops Center API Configuration Manager, see the *Hitachi Ops Center API Configuration Manager REST API Reference Guide*.

When creating Ops Center API Configuration Manager server connections, you must set up credentials as follows:

- For services that use Configuration Manager, create one connection that uses the same credentials for each storage system managed by Configuration Manager. In addition, see the [Service template prerequisites \(on page 126\)](#) to ensure that the common credentials are assigned the required roles. For example, for the Create Online Migration Pair service, the credentials must be assigned the following roles:
 - Security Administrator (View & Modify)
 - Storage Administrator (Provisioning)
 - Storage Administrator (Remote Copy)
 - Storage Administrator (Initial Configuration)

Procedure

1. On the **Administration** tab, click **Connection Settings > Web Service Connections**.
2. Click **Add** or **Edit** and enter the following information:
 - **Category:** Select **ConfigurationManager**.
 - **Name:** Enter a name for the Ops Center API Configuration Manager instance.
 - **IP Address/Host Name:** Enter the host name or IP Address of the Ops Center API Configuration Manager server.
 - **Protocol:** Select **http** (default) or **https**.
 - **Port**
 - **User ID** An account with operation privileges on the storage system.
 - **Password** An account with operation privileges on the storage system.
3. Clear the **Use Proxy Server** check box. You cannot use a proxy server with Ops Center API Configuration Manager.
4. Enter assigned infrastructure groups.
5. (Optional) You can test the connection with the values you specified by clicking **Test**. After starting the test, a notification balloon appears above the **Test** button indicating whether the connections completed successfully. To stop the testing process, click **Stop Test**.
6. Click **OK**.

Configuring a Web Service Connection for Ops Center Administrator

When using Ops Center Administrator services, you must register a Web Service Connection for Ops Center Administrator.

You can add or edit a Web Service Connection for Ops Center Administrator by using the following procedure:

Procedure

1. From the **Administration** tab, click **Connection Settings > Web Service Connections**.

2. Click **Add** or **Edit** and enter the following information:

- **Category:** OpsCenterAdministrator
- **Name:** Enter a name for the Ops Center Administrator connection.
- **IP Address/Host Name:** The Ops Center Administrator server name
- **Protocol:** https (Cannot be changed)



Note: When you use https with Web Service connections, you must first import certificates for the Web Service Connection and import certificates into the Java truststore. For detailed information, see the *Hitachi Ops Center Automator Installation and Configuration Guide*.

- **Port:** 443 (default)



Note: If you installed Ops Center Administrator by using the Ops Center OVA or the Express installer, you must edit this value even if you use the default port number (20961).

- **User ID:** An account with operation privileges on Ops Center Administrator



Note: You can only specify an Ops Center Administrator local user. You cannot specify a Common Services user even if you have integrated users with Ops Center Common Services.

- **Password:** The password of the account on Ops Center Administrator

3. Clear the **Use Proxy Server** check box. You cannot use a proxy server with Ops Center Administrator.

4. Enter assigned infrastructure groups.

5. (Optional) You can test the connection with the values you specified by clicking **Test**. After starting the test, a notification balloon appears above the **Test** button indicating whether the connections completed successfully. To stop the testing process, click **Stop Test**.

6. Click **OK**.

Configuring a Web Service connection for Ops Center Analyzer

When using Ops Center Analyzer services, you must register a Web Service Connection for Ops Center Analyzer.

You can add or edit a web service connection for Ops Center Analyzer by using the following procedure:

Procedure

1. From the **Administration** tab, click **Connection Settings > Web Service Connections**.
2. Click **Add** or **Edit** and enter the following information:
 - **Category:** OpsCenterAnalyzer
 - **Name:** Enter a name for the Ops Center Analyzer connection.

- **IP Address/Host Name:** The host name or IP address of the Ops Center Analyzer server
- **Protocol:** Select http (default) or https.



Note: When you use https with Web Service connections, you must first import certificates for the Web Service Connection and import certificates into the Java truststore. For detailed information, see the *Hitachi Ops Center Automator Installation and Configuration Guide*.

- **Port:** 22015 (default)
 - **User ID:** An account with operation privileges on Ops Center Analyzer
 - **Password:** The password of the account with operation privileges on Ops Center Analyzer
3. Clear the **Use Proxy Server** check box. You cannot use a proxy server with Ops Center Analyzer.
 4. Enter assigned infrastructure groups.
 5. (Optional) You can test the connection with the values you specified by clicking **Test**. After starting the test, a notification balloon appears above the **Test** button indicating whether the connections completed successfully. To stop the testing process, click **Stop Test**.
 6. Click **OK**.

Configuring VMware vCenter connections

Ops Center Automator services can perform remote functions on VMware vCenter servers. A connection setting is required for the VMware vCenter server. This type of connection enables Ops Center Automator Services to create data stores in a VMware environment. The Admin role is generally required to set up the connection. For exceptions, see each service catalog topic.

Procedure

1. From the **Administration** tab, click **Connection Settings > Web Service Connections**.
2. Click **Add** and enter the following information:
 - **Category:** Select vCenter.
 - **Name**
 - **IP Address/Host Name**
 - **Protocol:** https (Cannot be changed)
 - **Port:** 443 (Cannot be changed)
 - **User ID**
 - **Password**
3. Enter assigned infrastructure groups.
4. Click **OK**.

5. (Optional) You can test the connection with the values you specified by clicking **Test**. After starting the test, a notification balloon appears above the **Test** button indicating whether the connections completed successfully. To stop the testing process, click **Stop Test**.
6. Click **OK**.


Configuring a Web Service Connection for ServiceNow

When using ServiceNow ticketing services, you must register a Web Service Connection for ServiceNow.

You can add or edit a Web Service Connection for ServiceNow by using the following procedure:

Procedure

1. From the **Administration** tab, click **Connection Settings > Web Service Connections**.
2. Click **Add** or **Edit** and enter the following information:
 - **Category:** ServiceNow
 - **Name:** Enter a name for the ServiceNow connection.
 - **IP Address/Host Name:** The ServiceNow instance name
 - **Protocol:** https (Cannot be changed)

 **Note:** When you use https with Web Service connections, you must first import certificates for the Web Service Connection and import certificates into the Java truststore. For detailed information, see the *Hitachi Ops Center Automator Installation and Configuration Guide*.

 - **Port:** 443
 - **User ID:** An account with operation privileges on ServiceNow
 - **Password:** The password of the account with operation privileges on ServiceNow
3. To use a proxy server, select the **Use Proxy Server** check box and enter the following information:
 - IP Address/Host Name
 - Port
 - Authentication
 - Authentication Type
 - User ID
 - Password
4. Enter assigned infrastructure groups.
5. (Optional) You can test the connection with the values you specified by clicking **Test**. After starting the test, a notification balloon appears above the **Test** button indicating whether the connections completed successfully. To stop the testing process, click **Stop Test**.

6. Click **OK**.

Configuring agentless remote connections

Before you begin

Ops Center Automator services can perform remote functions on other servers. Register and manage connection settings to hosts through **Agentless Remote Connections**. The Admin role is required to set up the agentless remote connections.

Consult "Windows prerequisites for agentless connections" or "SSH prerequisites for agentless connections" in the *Hitachi Ops Center Automator Installation and Configuration Guide* for details on setting up a remote connection.

When specifying a range of addresses (for example, X.X.X.A to X.X.X.B) for IPv4, use a hyphen (-) as shown in the following format:

Format: X.X.X.A-B

Correct examples:

192.168.1.1-255 (from 192.168.1.1 to 192.168.1.255) 192.168.1.5-15 (from 192.168.1.5 to 192.168.1.15)

Incorrect example:

192.168.1-2.4

When specifying a range of addresses for IPv6, use a network preface that conforms to RFC 2373.

Procedure

1. On the **Administration** tab, click **Connection Settings > Agentless Remote Connections**.
2. Click **Add** to add a connection. To edit a connection, select the check box next to the connection, then click **Edit**. Enter or edit the following information:
 - **Method:** Select Host Name, IPv4, or IPv6
 - **IP Address/Host Name:** Enter an IP address if you are using IPv4 or IPv6, or a enter a host name.

- **Authentication:** Enabled by default. When disabled, access to the host is anonymous.
- **Protocol:** If authentication is used, select Windows, SSH, or Telnet. Depending on the protocol you have selected, a dialog box is provided for specifying the authentication method along with any necessary passwords.
 - **User ID:** Required if authentication is used.
 - **Password:** Required if authentication is used.
 - **Super User's Password:** Required if Protocol is SSH or Telnet.

When choosing SSH as your authentication protocol, you have the option of specifying Password Authentication, Public Key Authentication, or Keyboard Interactive Authentication.



Note: Even when you want to perform remote functions on the local host, registering the local host setting is required. In this case, the setting for Authentication is not required.

3. Enter assigned infrastructure groups.
4. Click **OK**.
5. (Optional) After specifying the details for setting up an agentless remote connection (Authentication option enabled), you can test the connection.
 - a. Click **Test**.
 - b. If multiple IP addresses or hosts are specified, select a specific address or host.
 - c. To stop the testing process, click **Stop Test**.

A notification balloon appears above the **Test** button indicating whether the connections completed successfully.

6. (Optional) To verify the connection status later, go to the **Agentless Remote Connections** window to view the status(Successful, Error, Unknown, and Unavailable) and the time when the connection was last established. To update the information, click **Refresh**.

Registering storage systems to an Ops Center API Configuration Manager connection

You must register storage systems in advance before you can use them with the Ops Center API Configuration Manager and the Ops Center Automator storage automation services.

From the Configuration Manager Settings window on the Administration tab, you can:

- Register and delete local storage systems.
- Refresh and update local storage system status and information.
- Register and delete remote storage system information.



Note: Ops Center API Configuration Manager uses various ports for communication between REST API clients, management servers, and storage systems. In addition, Ops Center API Configuration Manager uses additional ports for communications between the primary and secondary sites when a remote copy is performed.

Make sure that these ports are open before registering a storage system or submitting a service. If the proper ports are not open, registering a storage system might fail or the task might fail. For affected service templates, see [Service template prerequisites \(on page 126\)](#).

For details, see "Ports used by the REST API" and "Ports used during remote copy operations" in the *Hitachi Ops Center API Configuration Manager REST API Reference Guide*.

When the certificate verification feature is enabled in the VSP One B24, VSP One B26, and VSP One B28 storage systems (microcode version A3-04-01-XX or later), the following problems might occur:

- In the [Register Local Storage System] dialog box, registering a storage system with the [Receive configuration-change notifications from the storage system] option enabled might fail.
- The database used by Ops Center API Configuration Manager search function does not match the resource information of the storage system, and the service templates that assume Ops Center API Configuration Manager might not work correctly.
- In the [Register Remote Storage System] dialog box, registering a remote storage system might fail.
- The actions related to remote copy might fail, and the following service templates might not work correctly:
 - Allocate Volumes with 2DC Remote Replication
 - Allocate Volumes with Remote Replication (Global-Active Device)
 - Create Online Migration Pair
 - Create Online Migration Pairs for Multiple Hosts
 - Migrate Data for Online Migration Pair
 - Clean up Online Migration Pair

When these problems occur, see "Setting up SSL communication" in the *Hitachi Ops Center API Configuration Manager REST API Reference Guide* and review the SSL communication settings.

Registering a local storage system to an Ops Center API Configuration Manager connection

Before you begin

Verify the following:

- A Web Service connection exists for the Ops Center API Configuration Manager server on which you plan to register the storage system in Connection Settings > Web Service Connections on the Administration tab.

See [Configuring Ops Center API Configuration Manager connections \(on page 87\)](#) for more information.

- You have an account with Administrator user group (built-in group) permissions on the storage system.

Procedure

1. On the **Administration** tab, select **Storage Service Settings > Configuration Manager Settings**.
2. From the **Configuration Manager Connections** section at the top of the window, select the Ops Center API Configuration Manager connection to which you want to add a storage system.
3. At the top of the Local Storage System section, click **Register**.
4. In the **Register Local Storage System** dialog box, enter the following information for the storage system:

The dialog content changes depending on the storage system model you select.

- **Model:** Select the storage system model from the Model list.
- **Serial Number:** Enter the storage system serial number.
- **Target Controller:** Select the controller operated by Configuration Manager from the Controller list.
- **Controller1 IP Address:** Specify the IPv4 or IPv6 IP address of storage system controller 1.
- **Controller2 IP Address:** Specify the IPv4 or IPv6 IP address of the storage system controller 2.
- **Link with SVP:** Select this check box to enable SVP integration.
- **SVP IP Address:** Enter the storage system SVP IP address.
- **RMI Port:** Specify the storage system RMI port number. The default port number is 1099.

- **Enable SSL communication with SVP:** Optionally, select the check box to enable SSL.

If this option is selected, the following item is shown:

- **SVP HTTPS Port:** Specify the port number that SVP uses for HTTPS communication. The default port number is 443.
- **Receive configuration-change notifications from the storage system:** Select the check box to receive configuration change notifications from the storage system.



Note: If the database of the Ops Center API Configuration Manager used for the search function does not match the resource information of the storage system, service templates might not work properly.

Therefore, you should enable **Receive configuration-change notifications from the storage system**.

5. Click **OK**.



Note: If storage system information such as the IP address or port number changes, you must delete the storage system and register it again.

Registering a remote storage system to an Ops Center API Configuration Manager connection

Before you begin

Verify the following:

- A Web service connection exists for both the Ops Center API Configuration Manager server managing the local storage systems and for the Ops Center API Configuration Manager server managing the remote storage systems.

See [Configuring Configuration Manager REST API connections \(on page 87\)](#) for more information.

- You have an account with Administrator user group (built-in group) permissions on the storage system.
- The local storage system is registered to the Ops Center API Configuration Manager server at the local site.
- The remote storage system is registered to the Ops Center API Configuration Manager server at the remote site.

Procedure

1. On the **Administration** tab, select **Storage Service Settings > Configuration Manager Settings**.
2. From the Configuration Manager Connection section at the top of the window, select the Ops Center API Configuration Manager connection to which the local storage system is registered.
3. In the Local Storage System section, select the local storage system for which you want to add a remote storage system.

4. At the top of the Remote Storage System section, click **Register**.
5. In the **Register Remote Storage System** dialog box, select the remote site Ops Center API Configuration Manager server to which the remote storage system is registered.
6. Select the remote storage system to register in the Ops Center API Configuration Manager server that manages the local storage system.
7. For VSP E series, VSP 5000 series, VSP G350, G370, G700, G900, and VSP F350, F370, F700, F900 storage systems, specify the IP address or host name of the Platform REST API server of the remote storage system. For other storage systems, specify the IP address or host name of the Ops Center API Configuration Manager server of the remote storage system.
8. For VSP E series, VSP 5000 series, VSP G350, G370, G700, G900, and VSP F350, F370, F700, F900 storage systems, specify the https listening port number (default 443) of the Platform REST API server of the remote storage system. For other storage systems, specify the https listening port number (default 23451) of the Ops Center API Configuration Manager server of the remote storage system.
9. Select the **Enable Configuration Manager Mutual Registration** check box to automatically register the local storage system information to the Ops Center API Configuration Manager server managing the remote storage systems.
10. Click **OK**.



Note: To change the remote storage system information registered in the Ops Center API Configuration Manager server, delete the remote storage system information and register again.

Deleting local storage system information from an Ops Center API Configuration Manager connection

Procedure

1. On the **Administration** tab, select **Storage Service Settings > Configuration Manager Settings**.
2. From the Ops Center API Configuration Manager Connection section at the top, select the Ops Center API Configuration Manager connection to which the local storage system is registered.
3. From the **Local Storage System** list, select the local storage system to delete.
4. Click **Delete**.
5. From the **Delete Local Storage System** dialog box, confirm that you want to delete the storage system, then click **OK**.

Deleting remote storage system information from an Ops Center API Configuration Manager connection

Procedure

1. On the **Administration** tab, select **Storage Service Settings > Configuration Manager Settings**.

2. From the Ops Center API Configuration Manager Connection section at the top, select the Ops Center API Configuration Manager connection to which the local storage system is registered.
3. From the **Local Storage System** list, select the local storage system.
4. In the **Remote Storage** section, click **Delete**.
5. From the **Delete Remote Storage System** dialog box, select the Ops Center API Configuration Manager connection to which the remote storage system you want to delete is registered.
6. In the **Remote Storage System** section, select the remote storage system you want to delete.
7. Select the **Enable Configuration Manager Mutual Deletion** check box to automatically delete the local storage system information registered in the Ops Center API Configuration Manager server on the remote storage system side.
8. Confirm that you want to delete the storage system, then click **OK**.

Refreshing local storage system information in Configuration Manager

You can refresh local storage system information for storage systems registered in Configuration Manager.

Procedure

1. In the **Configuration Manager Connections** list, select the Configuration Manager in which the storage systems to be refreshed are registered.
2. Select the storage systems to be refreshed in the **Local Storage Systems** list. Multiple selections are allowed.
3. Click **Refresh Storage System**.
4. Confirm the storage systems to be refreshed and click **OK**.

Updating local storage system status in Configuration Manager






You can update the status of local storage systems registered in Configuration Manager.

Procedure

1. In the **Configuration Manager Connections** list, select the Configuration Manager in which the storage systems to be updated are registered.
2. Select the storage systems to be refreshed in the **Local Storage Systems** list. Multiple selections are allowed.
3. Click **Update Refresh Status**.

Result

Ops Center Automator reloads the Local Storage System list and displays one of the following icons for each selected storage system:

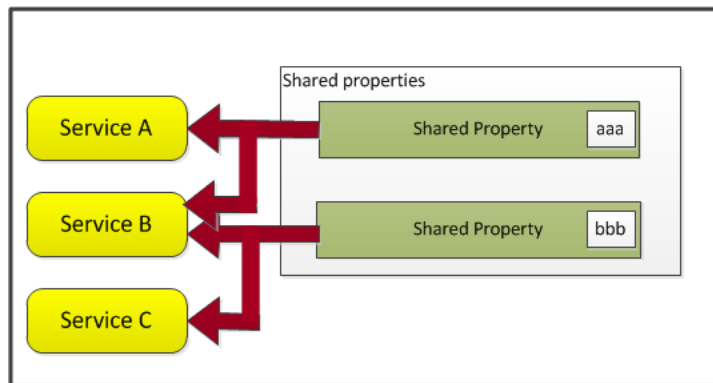
Icon	Status	Description
	Queued	The configuration information refresh task has been queued.
	Started	The configuration information refresh has started.
	Succeeded	The configuration information refreshed successfully.
	Failed	The configuration information refresh failed.
	PartiallyNotUpdated	Part of the task to refresh the configuration information failed.

Using shared properties

Ops Center Automator enables you to share the values specified for a service among multiple services. Settings that are shared are called the shared properties. For example, if you use a service template to manage a common server and you define the host name, user ID, and password for that server at the connection destination as shared properties, you save the time needed to enter this server information each time a service is run. In some instances, all storage services might share the same address.

When you assign a value to a service, it takes effect when the target service is submitted for execution. Changes that are made to a property value do not affect services that are already submitted. Property values set after submitting a service are applied to tasks that are generated from the target service. To apply a shared property value to services that are submitted, you must stop the service and then submit it again.

The following figure shows how the value of a shared property is shared over multiple services.



Ops Center Automator has a set of built-in shared properties that are based on common provisioning tasks. Additionally, shared properties can be customized when creating a service template using Service Builder.

Built-in shared properties

Shared properties are found in the settings of each service to which they apply. The built-in shared properties with their default values are also located on the Administration tab under Shared Properties Settings.



Note: When a task runs, the values in the built-in shared properties are applied to the task. If you change a value of a built-in shared property, the change will apply to the task the next time it runs.

The following table lists the shared service properties that are provided with Ops Center Automator.

Shared service properties	Description	Values
Pass phrase of the private key (for SSH public key authentication)	Specifies the passphrase for the private key used for SSH public key authentication (shared built-in service property).	The default is empty.
Python Interpreter Path	Specifies the Python Interpreter Path.	The default is "python".

Modifying the shared service properties

The Admin role is required to modify the values of the shared properties.

Procedure

1. On the **Administration** tab, click **Shared Properties Settings**.
2. Select a shared property, then click **Edit**.
3. Enter the value of the property, then click **OK**.

Configuring email and log settings

The system settings are used to configure the email notifications and log parameters in Ops Center Automator. The Admin role is required to configure the system settings.

Email notifications are sent to users when a task fails ("Failed" status) or a task detects an error ("In Progress (with Error)" status). Also, Ops Center Automator needs for the SMTP Server settings to send an email.

Procedure

1. On the **Administration** tab, click **System Settings**.
2. Click **Edit**.

3. In the **Email** section, enter the following information. For email addresses, you can specify multiple email addresses separated with commas:
 - **Server Address:** SMTP server name or IP address. Ops Center Automator supports SMTP Servers on which SMTP-AUTH (Only PLAIN, LOGIN, and DIGEST-MD5 are supported as the authentication method) is set. (Required)
 - **Server Port:** SMTP server port number. (Required)
 - **User ID:** for the email account. (Required)
 - **Password:** for the email account. (Required)
 - **From:** sender's email address.
 - **To:** recipient's email address.
 - **Cc:** copy to email address.
 - **Bcc:** blind copy to email address.
4. Click **System Parameters** to expand the section and update the following settings:
 - **E-mail notification:** ON or OFF.
 - **Task Threshold Settings**
 - **Severe:** output for only severe logs.
 - **Information:** Output for severe and informational logs. (Default)
 - **Fine:** Output for detailed logs for tracing purposes.
 - **Finer:** Output for highly detailed logs for tracing purposes.
 - **Debug:** Output for all log levels including debug logs.
5. Click **Save**.

Setting up an external resource provider

You can set up an external resource provider to supply code, commands, or executables from a file for the settings and parameters associated with an input or output property. You can also import or export an existing resource provider after it is defined so that it can be reused and shared by other service templates.

After you set up an external resource provider, it can be accessed from an input property associated with a service template from Automator Service Builder.

You set up an external resource provider from the Administration tab.

Procedure

1. On the **Administration** tab, click **External Resource Provider**.
The **Edit External Resource Provider** interface appears.
2. Click **Create** to enter the details for the new external resource provider.
The **Edit External Resource Provider Information** dialog box appears.

3. Enter the following information.
 - **Name:** Name assigned to the new resource provider.
 - **Version:** A version number is assigned.
 - **Content Type:** Select **application/json** or **text/csv** for the content type.
 - **Schema ID:** If there is a domain type corresponding to the returned value of the external resource provider, enter the Schema ID. The Schema ID helps select an external resource provider in the property for service/plug-in settings dialog boxes in Automator Service Builder.
 - **Description:** Provide a description for the resource provider.
 - **Type:** Select either **JavaScript**, **Script**, **Command Line**, or **File**. Depending on your selection, enter the information in the provided field.
4. Click **OK**.
The name of the new external resource provider is shown in the list along with its assigned UUID number and any other descriptive information.
5. (Optional) After creating a resource provider, you can choose one of the options from the **More Actions** menu to export or delete an existing external resource provider entry. Additionally, you can click **Import** to import a previously exported external resource provider.

For more information on how to implement an external resource provider, see the *Hitachi Ops Center Automator Service Builder User Guide*.

About Ansible integration

With Ops Center Automator Ansible modules, you can provision and manage the storage in your infrastructure. Ops Center Automator users can extend their automation workflow using core modules from the Ansible playbook with Ops Center Automator service templates.

For example, an Ansible user can:

- Run Automator service tasks sequentially before and after starting the Ansible core module from the playbooks.
- Run multiple Automator service tasks sequentially from the playbooks.

For detailed information on Ansible, see the Ansible documentation.

Idempotency

One of the benefits of integrating Ops Center Automator with Ansible modules is that Ansible playbook gives task-level *idempotency*. As it relates to running Automator services, idempotency means that the playbook ensures that the same task is not run multiple times. If Ansible identifies that the same task (identified by task name) is running more than one time, it sends the initial result instead of running the task again.

For more information, see the Ansible documentation.

Ansible module installation and prerequisites

The Ansible module is distributed as part of the Ops Center Automator installation media in the following location:

In Windows:

```
Automation-software-installation-folder\public\ansible
\Ansible_Module_version.tar.gz
```

In Linux:

```
Automation-software-installation-directory/public/ansible/
Ansible_Module_version.tar.gz
```

To use the Ansible Module, copy the `modules` and the `module_utils` folders from `Ansible_Module_Version.tar.gz` to the following directory on the Ansible control node:

- `/usr/share/ansible/plugins/modules`
- `/usr/share/ansible/plugins/module_utils`

The following software is required to use Ansible with Ops Center Automator:

- Ansible 7.3, 9.0
- Red Hat Enterprise Linux 8.8, 8.10, 9.2, 9.4
- Oracle Linux 8.8, 8.10, 9.2, 9.4
- Python 3.9, 3.10, 3.11, 3.12

Ansible modules for Ops Center Automator

Two modules in the Ansible playbook are needed to use Ops Center Automator.

Submit Automator Service

automation_submit_service

Invoke the Automator service from the Ansible playbook

Get Automator Task

automation_task_detail_info

Get details of the task result of the submitted Automator service

**Note:**

- If Common Services is linked with an identity provider, the identity provider user cannot access Ops Center Automator from the Ansible playbook.
- When the Ansible playbook is run with the `--check` option, it will not make any changes. Instead it will preverify the parameters and report whether a new task will be created. The `automation_submit_service` module supports check mode (`--check` option), but the `automation_task_info` module does not.
- By default, the Automator Ansible modules use the `http_proxy` or `no_proxy` environment variables on the managed node. If there was an error caused by using an unintended proxy, you can specify `no_proxy` to avoid using a proxy.
- Only UTF-8 has been verified as the encoding type of the Ansible playbook.

For more information on how to use the Ansible playbook, see the Ansible documentation.

The parameters of the Automator modules for the Ansible playbook are shown in the following tables.

Table 1 Input parameters for automation_submit_service module

Name	Type	Description	Range	Default value
host*	string	The hostname or IP address of the Automator server.	-	-
port	integer	The TCP port number of the Automator server to access the REST API endpoint.	-	22015 or 22016
ssl	boolean	Specify whether to enable SSL communication for connecting to the server. SSL communication for connecting to the Common Services server is enabled regardless of the setting of this parameter.	yes or no	yes
validate_certs	boolean	Specify whether to enable validation for server SSL certificate. This parameter is ignored if the <code>ssl</code> parameter is set to no.	yes or no	yes
user*	string	The user name to access the Automator server.	-	-

Name	Type	Description	Range	Default value
password*	string	The password to access the Automator server. The <code>no_log</code> option is enabled by default to ensure that password data is not recorded in the log.	-	-
service_name*	string	The name of target service to run, which is configured within the Automator server.	-	-
service_group	string	The name of the service group to which the target service belongs. If this option is not specified, the service group that is associated with the user is applied.	-	-
service_parameters	dictionary	Dictionary parameter that contains a "keyName" and "value" pair to be passed when running the service. The specified parameters are prioritized over the default parameters specified in the service. The key-value pairs to pass as input required to run the service. Format each key and value as a string type. This parameter only supports the "true" or "false" boolean notation. Use the <code>no_log</code> option to ensure that sensitive data is not recorded in the log.	-	empty dictionary

Name	Type	Description	Range	Default value
task_name	string	The name of the task. If this option is not specified, a default unique name is assigned. If a task with the same task_name exists and has already finished, this module returns the information from the finished task, and skips to submit a new task.	-	-
task_description	string	The task description.	-	-
task_wait	boolean	Specify <code>yes</code> for the module to wait for the task to finish before sending a result. Specify <code>no</code> for the module to send a result immediately after the service request is accepted by the Automator server.	yes or no	yes
task_timeout	integer	The timeout value for the wait completion of the task (in seconds). If <code>no</code> is specified for the <code>task_wait</code> parameter, this parameter is ignored. If you specify a value greater than 31536000 (1 year), the Automator module internally assign 31536000 to <code>task_timeout</code> .	5 - 31536000	3600
wait_interval	integer	The interval (in seconds) for verifying the Automator server for task completion. If <code>no</code> is specified for the <code>task_wait</code> parameter, this parameter is ignored.	5 - 300	30

Name	Type	Description	Range	Default value
cs_host	string	The host name or IP address of Common Services where the Ops Center Automator specified for the "host" parameter is registered. If you specify this parameter, you must set up SSL communication between the Ops Center Automator server and the Common Services server. If this is not specified, Common Component user authentication is used to access Ops Center Automator.	-	-
cs_port	integer	The port number of Common Services where the Ops Center Automator specified for the "host" parameter is registered. If this is not specified, the default value of 443 is set.	-	443
*: Required				

Table 2 Output parameters

Parameter	Type	Comments
outputs	json	The task output properties.

The json object contains the following elements:

properties

Key-value pairs of input and output parameters.

task

The Automator task object.

id

Instance ID of the Automator task object.

The following is an example output parameter structure:

```
{
  "outputs": {
    "id": 600943,
    "properties": {
      "propertyKey1": "10",
      "propertyKey2": "20"
    }
  },
  "task": {
    "instanceID" : 600943,
    "name" : "add_number_service_20200115144709",
    "status" : "completed",
    "startTime" : "2020-01-15T14:47:12.000+09:00",
    "completionTime" : "2020-01-15T14:47:12.000+09:00",
    "submitter" : "System",
    "submitTime" : "2020-01-15T14:47:12.000+09:00",
    "modifyTime" : "2020-01-15T14:47:12.000+09:00",
    "serviceState" : "release",
    "scheduleType" : "immediate",
    "description" : "",
    "serviceName" : "add_number_service",
    "tags" : "",
    "serviceGroupName" : "Default Service Group",
    "toDo" : false,
    "notes" : "",
    "supportedActionType" : "forciblyStop,retry",
    "serviceTemplateID" : 596812,
    "scheduleID" : 600962,
    "serviceGroupID" : 595910,
    "serviceID" : 600882
  }
}
```

Table 3 Input parameters for automation_task_detail_info module

Name	Type	Description	Range	Default value
host*	string	The hostname or IP address of the Automator server.	-	-
port	integer	The TCP port number of the Automator server to access the REST API endpoint.	-	22015 or 22016

Name	Type	Description	Range	Default value
ssl	boolean	Specify whether to enable SSL communication for connecting to the server. SSL communication for connecting to the Common Services server is enabled regardless of the setting of this parameter.	yes or no	yes
validate_certs	boolean	Specify whether to enable validation for server SSL certificate. This parameter is ignored if the <code>ssl</code> parameter is set to no.	yes or no	yes
user*	string	The user name to access the Automator server.	-	-
password*	string	The password to access the Automator server. The <code>no_log</code> option is enabled by default to ensure that password data is not recorded in the log.	-	-
task_id*	integer	The task id of the Ops Center Automator service to be invoked by Ansible module.	-	-
task_wait	boolean	Specify <code>yes</code> for the module to wait for the task to finish before sending a result. Specify <code>no</code> for the module to send a result immediately after the service request is accepted by the Automator server.	yes or no	yes
task_timeout	integer	The timeout value for the wait completion of the task (in seconds). If <code>no</code> is specified for the <code>task_wait</code> parameter, this parameter is ignored. If you specify a value greater than 31536000 (1 year), the Automator module internally assign 31536000 to <code>task_timeout</code> .	5 - 31536000	3600

Name	Type	Description	Range	Default value
wait_interval	integer	The interval (in seconds) for verifying the Automator server for task completion. If <code>no</code> is specified for the <code>task_wait</code> parameter, this parameter is ignored.	5 - 300	30
cs_host	string	The host name or IP address of Common Services where the Ops Center Automator specified for the "host" parameter is registered. If you specify this parameter, you must set up SSL communication between the Ops Center Automator server and the Common Services server. If this is not specified, Common Component user authentication is used to access Ops Center Automator.	-	-
cs_port	integer	The port number of Common Services where the Ops Center Automator specified for the "host" parameter is registered. If this is not specified, the default value of 443 is set.	-	443
*: Required				

Table 4 Output parameters

Parameter	Type	Comments
outputs	json	The task output properties.

The json object contains the following elements:

properties

Key-value pairs of input and output parameters.

task

The Automator task object.

id

Instance ID of the Automator task object.

About logging

By default Ansible sends output about plays, tasks, and module arguments to your screen (STDOUT) on the control node. To capture Ansible output in a log, see the Ansible documentation.

If you deal any sensitive data while running the Ansible playbook, such as passwords or user names, you should use the `no_log` option on the task. If the playbook fails and no details are output, then you should disable the `no_log` option and re-run the playbook.

For more information about the `no_log` option, see the Ansible documentation.

Using the sample playbook

This section explains how to run a Sample Playbook.

The sample playbook is distributed as part of the Ops Center Automator installation media in the following location:

In Windows:

```
Automation-software-installation-folder\public\ansible\sample
\Sample_Playbook_Role_version.tar.gz
```

In Linux:

```
Automation-software-installation-directory/public/ansible/sample/
Sample_Playbook_Role_version.tar.gz
```

Using the AllocateVolumes playbook

This sample playbook will submit the Allocate Volumes with Smart Provisioning (02.93.00) service.

Procedure

1. Configure `ansible.cfg` and environment variables.
2. Confirm whether the service to run exists in advance. If it does not exist, create it.
3. Deploy the linkage module.
4. Encrypt `auth_info.yml` with the `ansible-vault` command.
5. Enable SSL settings between Ops Center Automator and Ansible and between Common Services and Ansible.
6. Edit the values to match the running environment. The files where the variables are set are as follows.

File path	To set
<code>roles/allocateVolumes/vars/main.yml</code>	Service settings Task settings Service parameters

File path	To set
connection_info_var/ automation_software_server1.yml	Ops Center Automator server and Common Services server information
connection_info_var/ auth_info.yml	Authentication information (for Vault)
roles/allocateVolumes/tasks/ submitAllocateVolumesService.yml	Uncomment the following lines if you use a Common Services user to access the Ops Center Automator server. #cs_host: "{{automation_software_cs_host}}" #cs_port: "{{automation_software_cs_port}}"

7. Run the following command:

```
$ansible-playbook AllocateVolumes_Playbook.yml --extra-vars
"@connection_info_var/automation_software_server1.yml" --extra-
vars "@connection_info_var/auth_info.yml" --ask-vault-pass
```

Setting up secure communication with the Ansible control node

Before you begin

You must do the following before setting up secure communications with Ansible:

- Enable secure client communication in Ops Center Automator.
- Create the Ops Center Automator SSL certificate with the required host name in CN (Common Name) or SAN(Subject Alternative Name).
- In the Ansible Control Node, make sure the certificate file extension is `.crt` or `.pem`.
- Import the Ops Center Automator CA certificate to the Linux certificate truststore.



Note: SSL is enabled by default after a new Ops Center Automator installation. In an upgrade installation, Ops Center Automator retains the current SSL settings.

If you want to use a new certificate, see "Setting up SSL on the server for secure client communication (Linux OS)" or "Setting up SSL on the server for secure client communication (Windows OS)" in the *Hitachi Ops Center Automator Installation and Configuration Guide*.

- Import the Common Services CA certificate to the Linux certificate truststore. For details about the Common Services certificates, see "Configuring SSL communications" in the *Hitachi Ops Center Installation and Configuration Guide*.

Prepare the playbook (Ansible control node):

Procedure

1. Set the following parameters for Ops Center Automator Ansible modules:

host: *Automator_host_name*

The specified host name must match the CN or SAN attribute of the certificate.

port: *SSL_port_number*

When the `ssl` parameter is set to `yes`, the default value is 22016.

ssl: `yes`

The default value is `yes`.

validate_certs: `yes`

The default value is `yes`.

2. Set the following parameters if you use a Common Services user to access the Ops Center Automator server:

- **cs_host:** *Common_Services_host_name*

The specified host name must match the CN or SAN attribute of the certificate.

- **cs_port:** *Common_Services_SSL_port_number*

When the `ssl` parameter is set to `yes`, the default value is 443.

3. Run the playbook with an Ansible command, for example:

```
$ ansible-playbook
```

ServiceNow workflow integration

You can integrate an Ops Center Automator service into a ServiceNow workflow. Integrating an Ops Center Automator service into a ServiceNow workflow consists of the following high-level steps:

Integrating an Ops Center Automator service into a ServiceNow workflow consists of the following high-level steps:

- Importing the update set
- Installing a MID Server
- Creating a REST message
- Creating a workflow
- Creating a service catalog item
- Running the workflow

Information about each of these steps is provided in this document, but you must see the ServiceNow product documentation for detailed information.



Note: For information about using Ops Center Automator ServiceNow templates to manage an entire workflow, see [ServiceNow ticketing service templates \(on page 345\)](#).

Prerequisite products for workflow integration

The ServiceNow workflow integration with Ops Center Automator needs the following:

- ServiceNow version Utah, Vancouver, Washington DC
- MID Server version Utah, Vancouver, Washington DC

For MID server requirements, see [MID Server system requirements](#) in the ServiceNow product documentation.

Importing an update set

In ServiceNow, you can export and import database information for a specific version of an application or set of configuration changes by using an XML file. A specific version or set of configuration changes is called an *update set*. When integrating Ops Center Automator with ServiceNow, the required configuration information is consolidated into an update sets that you must import.

The location of the update sets is shown below.

For Windows:

```
Ops-Center-Automator-installation-folder\public\ServiceNow
```

For Linux:

```
Ops-Center-Automator-installation-directory/public/ServiceNow
```

Update Sets must be imported in the following order:

1. Automation_Adapter_for_ServiceNow_01.61.00.xml
2. Automation_Adapter_for_ServiceNow_batch_02.82.00.xml

For information on how to import information by loading an update set, see the following in the ServiceNow product documentation.

- [Save an update set as a local XML file and load customizations from a single XML file](#)
- [Preview a remote update set](#)
- [Commit an update set](#)



Note: Verify that there are no existing Script Includes with the name "AutomationClientLibrary" so that no conflicts occur. If the name already exists, change the Script Include name and then edit the subworkflow (Invoke Automation Service) so that the class or function name match the new Script Include name.

Installing a MID server

Before you can integrate Ops Center Automator with ServiceNow, you must install the ServiceNow MID server that facilitates integration with external applications. In the ServiceNow integration of Ops Center Automator, the REST API commands are passed through the MID server.

You can install the MID server on the same server as Ops Center Automator or on a different server.

See [Installing the MID Server](#) in the ServiceNow product documentation for instructions.

Post installation tasks

After installing the MID server, set up secure communications between the MID server and Ops Center Automator, and between the MID server and Common Services.

Before setting up secure communications, do the following:

- Set up SSL on the Ops Center Automator server. For more information, see the *Hitachi Ops Center Automator Installation and Configuration Guide*.
- Create an Ops Center Automator SSL certificate by specifying an appropriate hostname to CN (Common Name) or SAN (Subject Alternative Name).

Complete the following steps:

1. Import the Ops Center Automator SSL certificate into the MID server keystore. If you use a Common Services user to access the Ops Center Automator server, also import the Common Services SSL certificate into the MID server keystore. For more information, see [Add SSL certificates for the MID Server](#) in the ServiceNow product documentation.
2. Restart the MID server.

Creating a REST message

To send a REST API request to a web service endpoint from ServiceNow, you must create a REST Message record. If you use a Common Services user to access the Ops Center Automator server, you must also create a REST Message record for Common Services. See [Create a REST message](#) in the ServiceNow product documentation for detailed instructions.

Creating a REST Message for Ops Center Automator

To send a REST API request to a web service endpoint from ServiceNow, you must create a REST Message record.

Procedure

1. From **Filter Navigator**, open **System Web Services > Outbound > REST Message**, then click **New**.

2. Set the following REST Message fields:

- Name: Enter a descriptive name for the REST message.
- Description: Enter a description of the REST message.
- Endpoint: Enter the endpoint to which this REST message is sent. The endpoint value might include variables using the format `${variable}`. To create a REST Message for Ops Center Automator integration, enter the following:

```
http(s)://automation-software-server-address:port_number/
Automation/${path}
```



Note: The specified IP address or host name must match the CN or SAN attribute of the certificate.

3. Set the following on the Authentication tab:

- Authentication type: Select Basic.
- Basic auth profile: Click the magnifier and select an existing Basic Auth Configuration profile or create a new one.

4. Click **Submit**.

5. Open the new REST Message and set the HTTP Methods:

- a. Click **New** in the HTTP Methods area.
- b. Set the following items:
 - Name: Enter the same name as the HTTP method.
 - HTTP method: GET, POST, PUT, or DELETE (GET and POST are required)
 - Endpoint: `http(s)://automation-software-server-address:port_number/Automation/${path}`
- c. Click the HTTP Request tab and in the **Use MID Server** field, select the MID Server to which the request is sent.
- d. (Optional) To test the HTTP method you created, click **Test** under **Related Links**. Repeat steps a. through d. for each HTTP method to be used.

Creating a REST message for Common Services

Procedure

1. From **Filter Navigator**, open **System Web Services > Outbound > REST Message**, then click **New**

2. Set the following REST Message fields:

- Name: Enter a descriptive name for the REST Message.
- Description: Enter a description of the REST Message.
- Endpoint: Enter the endpoint to which the REST Message is sent. The endpoint value might include variables using the format `${variable}`. To create a REST Message for Common Services integration, enter the following:

```
https://Common-Services-server-address:Common-Services-port-
number/portal/${path}
```



Note: The specified IP address or host name must match the CN or SAN attribute of the certificate.

3. Set the following items on the Authentication tab:
Authentication type: Select **No authentication**.
4. Click **Submit**.
5. Open the new REST Message and set the HTTP Methods:
 - a. Click **New** in the HTTP Methods area.
 - b. Set the following items:
 - Name: Enter the same name as the HTTP method.
 - HTTP method: GET, POST, PUT, or DELETE (GET and POST are required)
 - Endpoint: `http(s)://Common-Services-server-address:Common-Services-port-number/portal/${path}`
 - c. Click the HTTP Request tab and in the **Use MID Server** field, select the MID Server to which the request is sent.
 - d. (Optional) To test the HTTP method you created, click **Test** under **Related Links**. Repeat steps a. through d. for each HTTP method to be used.



Note: The specified IP address or host name must match the CN or SAN attribute of the certificate.

Creating a workflow

Creating a workflow enables you to connect processes that you want to automate by using ServiceNow. To run the Ops Center Automator service in a workflow, extend or include the sub-workflow (Invoke Automation Service) into an upper layer workflow and insert the parameter mapping step. In this sub-workflow, you define the common process sequences of running a service and reporting task status. Also, you can use the AutomationClientLibrary to include additional functions.

The following table shows the input service parameters to be specified when using the workflow integration.

Name	Type	Description	Maximum length	Default value	Required/Optional
Service Instance ID	String	Specify the instance ID of the service to submit.	256	<code>\${workflow.scratchpad.serviceInstanceID}</code>	Required
Request Parameters	String	Specifies the input properties of the service to submit.	102400	<code>\${workflow.scratchpad.requestParameters}</code>	Optional

Name	Type	Description	Maximum length	Default value	Required/Optional
Task Settings	String	Specify the task run schedule. If not specified, the task is run immediately.	102400	<code>\${workflow.scrathpad.taskSetting s}</code>	Optional
REST Message Name	String	Specify the name of the REST Message for which the Ops Center Automator endpoint is set.	256	<code>\${workflow.scrathpad.restMessage Name}</code>	Required
Use Common Services	String	Specify whether Common Services is used for user authentication.	256	<code>\${workflow.scrathpad.useCommonSe rvices}</code>	Optional
Common Services REST Message Name	String	Specify the name of the REST Message for which the Common Services endpoint is set.	256	<code>\${workflow.scrathpad.commonServi cesRestMessageNa me}</code>	Optional

See [Create a workflow](#) in the ServiceNow product documentation for instructions.

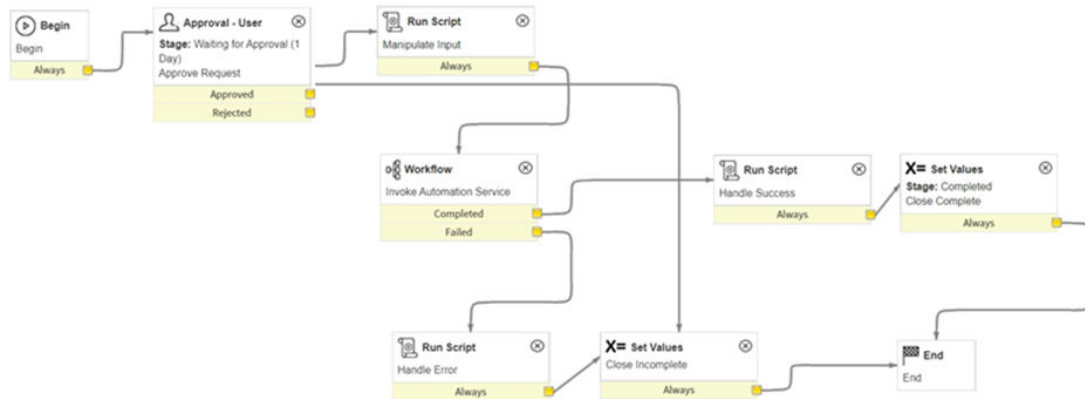
Sample workflow

The following is an example of a workflow that calls an Ops Center Automator service that incorporates the Invoke Automation Service sub-workflow.

.

In this workflow, the following actions are run as a series of flows:

- approval processing
- mapping user input to Ops Center Automator service request parameters
- running an Ops Center Automator service and receiving a result confirmation
- subsequent processing according to the result



Input for Invoke Automation Service sub-workflow

In the Invoke Automation Service sub-workflow, set the input service parameters.

- REST Message Name
- Request Parameters
- Service Instance ID
- Task Settings

In the sample workflow *Manipulate Input* step, user input values are mapped to variables of the Invoke Automation Service flow. The sample code is as follows:

```

workflow.scratchpad.serviceInstanceId = current.variables.had_service_instance_id; //
Service Instance ID
workflow.scratchpad.restMessageName = current.variables.had_rest_message_name; //REST
Message Name
workflow.scratchpad.useCommonServices = true; //Use Common Services
workflow.scratchpad.commonServicesRestMessageName =
current.variables.common_services_rest_message_name; //Common Services REST Message
Name

function RecordAccessor(ticket) {
    this.setRecord(ticket);
}

RecordAccessor.prototype = {
    setRecord: function(ticket) {
        this._ticket = ticket;
    },
    getSysId: function() {
        return this._ticket.sys_id;
    },
    getVariable: function(key) {
        return this._ticket.variables[key].toString();
    },
    getVariables: function() {
        return this._ticket.variables;
    }
}
  
```

```

    }
};
workflow.info("Manipulating input from service request");

var recordAccessor = new RecordAccessor(current);

/* Settings of Automator service input parameters(*) */
var requestParams = {};
requestParams["VolumeLabel"] = recordAccessor.getVariable("VolumeLabel"); //String
type parameter setting example
requestParams["StorageSystem"] = JSON.stringify({"storageDeviceId":
recordAccessor.getVariable("StorageDeviceId")}); //File type parameter setting example
/*~~~~~*/
/* (Set as much as required) */
/*~~~~~*/
workflow.info(JSON.stringify(requestParams, null, 2));
workflow.scratchpad.requestParameters = JSON.stringify(requestParams);

```

In `requestParams`, the required Ops Center Automator parameter Key and Value are set. You can also specify the service run schedule as a task setting. For details on the built-in service parameters and task settings, see "Submitting a service" in the *Hitachi Ops Center Automator REST API User and Reference Guide*.

After running the Ops Center Automator service and obtaining the result, you can implement post-processing according to the use case, such as updating the ticket as is shown in the sample workflow.

Output from Invoke Automation Service sub-workflow

The output of the Invoke Automation Service sub-workflow includes the following:

- `status`: Completed, Failed, or Canceled.
- `data`: JSON format data of the Ops Center Automator service output property values obtained by using the Ops Center Automator "Getting a list of property values" REST API.
- `message`: Error message (only when an error occurs).

You can easily obtain the Ops Center Automator service output property values provided in JSON format to use with a method defined in the `AutomationClientLibrary`. The sample code is as follows:

```

var result = workflow.scratchpad.hadresult;

var allocatedVolume = AutomationClientLibrary.findPropertyByValue (result.data,
'keyName', 'LUNPathConfigurationInformation').value; // Pick up value from JSON data
by specifying property keyName

workflow.info("Details of added volumes: " + JSON.stringify(allocatedVolume,null,2));

current["work_notes"] = JSON.stringify(allocatedVolume, null, 2);

```


Creating a service catalog item

A service catalog item is a request form for running a workflow. You must create a service catalog item for running a workflow that includes a process for running the Ops Center Automator service.

See [Create or edit a catalog item](#) in the ServiceNow product documentation for more information.

If you use a Common Services user to access the Ops Center Automator server, you must create a user name variable and a password variable for the service catalog item.

Specify the following values for the [Name] field in the [Variable] window:

- Common Services user name: commonServicesUserName
- Common Services password: commonServicesPassword

We recommend that you specify "Masked" for the [Type] field in the password variable. If you specify "Masked" for the [Type] field, you must uncheck the [Use encryption] check box in the definition of commonServicesPassword.



Note: If Common Services is linked with an identity provider, the identity provider user cannot access Ops Center Automator from the ServiceNow workflow.

Running the workflow

When running the ServiceNow workflow, enter the required items in the service catalog item request form and send the request.

The workflow might fail with the KNAE07646-E or KNAE07648-E error message. If the error occurs, check the load status of the MID Server, Ops Center Automator server, and Common Services server, and network load status, and then rerun the workflow. If the error recurs after rerunning, you can reduce the frequency of timeouts by adding the following property to the ServiceNow instance.

- Name: glide.http.outbound.max_timeout.enabled
- Type: true|false
- Value: false

See [Request creation](#) in the ServiceNow product documentation for more information.

Appendix A: Importing and exporting properties

While creating, editing, and submitting a service, you can import and export property values.

Buttons at the bottom of the **Create/Edit Service** and **Submit Service Request** windows allow you to import and export property values.

Importing property values while creating, editing, and submitting a service

While creating, editing, and submitting a service, you can import property values in a specified properties file.

Procedure

1. From the **Create/Edit Service** and **Submit Service Request** windows, click **Import**.
2. In the displayed dialog box, enter the name of the properties file to use for storing the property values, or use the browser to search for the specified file, then click **Open**.

When the import finishes, notifications about the property values that have and have not been imported are temporarily visible as follows:

- Updated properties: Properties to which values are applied.
- Skipped properties: Properties for which the attribute values cannot be changed and for which the values are not applied due to the property value definitions.
- Undefined properties: Properties that are defined in the file but do not exist in the target service.

When importing a properties file, the JSON or `key=value` format is supported.

The conditions that must be met to apply property values during an import are shown in the following table.

Property Group Attribute	Property Attribute				
	hidden	paramMode	visibility	reference	hidden
false	in	config	false	false	false
false	in	exec	false	--	--

If the properties do not meet these conditions, or there are no corresponding properties defined in the service, the values contained in the properties file are not applied. The values are also not applied if the "value" field is not defined or is set to null.



Note: If the length of `keyName` exceeds the limit, the property is classified as a property that does not exist in the service.

If an error occurs during an import, the error dialog box appears, and the import is canceled, leaving all property values unchanged. An error occurs when the specified file does not exist or the properties file definitions are not valid.

Properties file format

In the properties file, the property key and value used by the executed services can be defined in JSON and key=value format.

JSON format

```
{
  "properties": [
    {
      "keyName": "property-key",
      "displayName" : "property-display-name"
      "description" : "description-of-property"
      "type" : "property-type"
      "value": "property-value"
    },
    {
      "keyName": "property-key",
      "displayName" : "property-display-name"
      "description" : "description-of-property"
      "type" : "property-type"
      "value": "property-value"
    },
    ...
  ]
}
```

Following are definition details for the JSON format:

- The `displayName`, `description`, and `type` fields are optional.
- When you specify `"value": ""`, the property value is set to an empty value.
- The value for the password type property can be in plain text or encrypted. The "value" field of the password type property is not exported for security reasons. The defined value is imported as is.
- In the properties file, define only properties for which you want to set values. The values of properties that are not defined in the imported file remain unchanged. When exporting step properties, the type field is only output for the service component.

key=value format

To specify property values for a key=value properties file, use the following format:

```
property-key=property-value [line break]
```

Following are definition details of the key=value format:

- Specify a property name and a property value on each line.
- Lines starting with a hash mark (#) are handled as comment lines.
- Lines that do not contain an equal mark "=" are handled as comment lines.
- A line break needs to be added at the end of each property setting line.
- Do not add line breaks in the middle of the property name and property value lines.
- Characters are case-sensitive.
- Even when a "\" is contained in strings like service and plug-in resource files, you do not must type "\\".
- "\"" is handled as a "\".
- The characters at the beginning of a line up to the first equal sign (=) are treated as a property name.
- The characters after the equal sign (=) after the property name, until the end of the line are treated as the property value.
- The line break at the end of the properties file (EOF) is optional.
- Empty lines (lines containing line breaks only) are ignored.
- Both CR+LF and LF can be used as line breaks.
- When using the `property-key = [line break]` format, the property value is set to an empty value.

Exporting property values while creating, editing, and submitting a service

While creating, editing, and submitting a service, you can export property values to a properties file. This allows you to save multiple property values in a file for subsequent reference.

Procedure

1. From the **Create/Edit Service** and **Submit Service Request** windows, click **Export**.
2. Access the browser to get the downloaded properties file.

Result

The property values are exported in the JSON format and, by default, are saved to the `service_properties.json` file. See [Properties file format \(on page 123\)](#) for more information.

Appendix B: Services catalog

This appendix gives service details for the settings associated with the service templates that come with Ops Center Automator.

Server version required for each service template

The following table describes the Ops Center Automator server version required to use for each service template.

Service template		Ops Center Automator server version
Allocate volumes service templates		
	Allocate Fabric Aware Volumes with Configuration Manager	11.0.1 or later
	Allocate Volumes with Smart Provisioning	11.0.3 or later
	Allocate Volumes with Clone/Snapshot	11.0.1 or later
	Allocate Volumes with 2DC Remote Replication	11.0.1 or later
	Allocate Volumes with Remote Replication (Global-Active Device)	11.0.1 or later
ESX cluster service templates		
	Allocate Fabric Aware Volumes and Create Datastore for ESX Cluster	11.0.1 or later
	Add Host to Cluster in vCenter	11.0.1 or later
	Remove Host from Cluster in vCenter	10.9.0 or later
ESXi host service templates		
	Allocate Volumes, Fabric, and Datastore for ESXi Host	11.0.1 or later
Global-Active Device service template		
	Global-Active Device Setup	11.0.1 or later

Service template		Ops Center Automator server version
Online migration with Configuration Manager service templates		
	Create Online Migration Pair	11.0.1 or later
	Create Online Migration Pairs for Multiple Hosts	11.0.1 or later
	Migrate Data for Online Migration Pair	11.0.1 or later
	Clean up Online Migration Pair	11.0.1 or later
ServiceNow ticketing service templates		
	Call ServiceNow Table API	-
	Create ServiceNow Incident Ticket	-
	Update ServiceNow Incident Ticket	-
	Retrieve ServiceNow Incident Tickets	-

Service template prerequisites

The following shows the software and setup prerequisites for each of the service templates.

Allocate Fabric Aware Volumes with Configuration Manager

Software prerequisites

- Ops Center API Configuration Manager v10.7.0-00 or later
- When integrating with Cisco FC switches: Data Center Network Manager (DCNM) 7.1, 11.5
- When integrating with Brocade FC switches: Fabric OS (FOS) 8.2.2d, 8.2.3a, 8.2.3c1, 9.0.1b, 9.0.1e1, 9.1.0b

Setup prerequisites

- Register the LDEV ID and Host Group ID used by this service to the same resource group or virtual storage machine.
- Create a web service connection for the Ops Center API Configuration Manager that uses the same credentials for each storage system managed by Ops Center API Configuration Manager.

- Verify that the common credentials used to access all storage systems are assigned the following roles:
 - Security Administrator (View & Modify)
 - Storage Administrator (Provisioning)
- Create a web service connection for DCNM or FOS.
- For FOS, the user ID cannot be a user using RADIUS/LDAP access authentication.
- For FOS, verify the following:
 - FOS REST API is enabled.
 - Fabric name is set.
 - Ops Center Automator and FC switches are in the same LAN.
 - Ops Center Automator and FC switches are not connected via a proxy.
- For DCNM, verify that the registered user is assigned the network-admin role.
- For FOS, verify that the registered user is assigned the following roles:
 - For the default Fabric OS roles one of the following roles is required:
 - Admin
 - FabricAdmin
 - ZoneAdmin
- For user-defined roles, a role with both of the following permissions is required:
 - Fabric=O(Observe) or OM(Observe and Modify)
 - Zoning=OM(Observe and Modify)
- For Brocade FC switches with VirtualFabric feature enabled, the Virtual Fabric ID of the fabric to be operated is included in the Role-LF List for the user ID.

Allocate Volumes with Clone/Snapshot

Software prerequisites

- Ops Center API Configuration Manager v10.7.0-00 or later
- Network Management software:
 - Brocade Network Advisor (BNA) 12.4, 14.0, 14.2, 14.4
 - or
 - Data Center Network Manager (DCNM) 7.1, 11.5

Setup prerequisites

- Register the LDEV ID and the Host Group ID used by this service to the same resource group.
- Create at least one web service connection for the Ops Center API Configuration Manager server.

- Use the same credentials for each of the storage systems managed by the Ops Center API Configuration Manager server registered to the web service connections.
- Verify that the common credentials used to access all storage systems are assigned the following roles:
 - Storage Administrator (Provisioning)
 - Storage Administrator (Local Copy)
 - Security Administrator (View & Modify)
- Create a web service connection for the BNA or DCNM server.
- For BNA, verify that the registered user is assigned one of the following roles:
 - SAN System Administrator
 - Zone Administrator
- For DCNM, verify that the registered user is assigned the network-admin role.
- Verify that there are different DP Pools for the Primary and Secondary volumes for Clone.

Allocate Volumes with Smart Provisioning

Software prerequisites

- Ops Center API Configuration Manager v10.9.3-00 or later
- When integrating with Cisco FC switches:
Data Center Network Manager (DCNM) 7.1, 11.5
- When integrating with Brocade FC switches:
Fabric OS (FOS) 8.2.2d, 8.2.3a, 8.2.3c1, 9.0.1b, 9.0.1e1, 9.1.0b
- Ops Center Administrator v10.0.0-00 or later
- Ops Center Analyzer v10.0.0-00 or later

Setup prerequisites

- Create a web service connection for the Ops Center API Configuration Manager that uses the same credentials for each storage system managed by Configuration Manager.
- Verify that the common credentials used to access all storage systems are assigned the following roles:
 - Security Administrator (View & Modify)
 - Storage Administrator (Provisioning)
- Create a web service connection for DCNM or FOS.
- For FOS, the user ID cannot be a user using RADIUS/LDAP access authentication.

- For FOS, verify the following:
 - FOS REST API is enabled.
 - Fabric name is set.
 - Ops Center Automator and FC switches are in the same LAN.
 - Ops Center Automator and FC switches are not connected via a proxy.
- For DCNM, verify that the registered user is assigned the network-admin role.
- For FOS, verify that the registered user is assigned the following roles:
 - For the default Fabric OS roles one of the following roles is required:
 - Admin
 - FabricAdmin
 - ZoneAdmin
 - For user-defined roles, a role with both of the following permissions is required:
 - Fabric=O(Observe) or OM(Observe and Modify)
 - Zoning=OM(Observe and Modify)
- For Brocade FC switches with VirtualFabric feature enabled, the Virtual Fabric ID of the fabric to be operated is included in the Role-LF List for the user ID.
- When specifying hosts in Host Settings, create a web service connection for Ops Center Administrator that uses credentials with System Administrator permissions.
- When using performance data for provisioning, create a web service connection for Ops Center Analyzer that uses credentials with any one of the following roles
 - Admin
 - Modify
- Only one Ops Center Analyzer server can be selected when using provisioning, and the required amount of performance information is stored in the Ops Center Analyzer.
- When allocating volumes in VSM, add the LDEV ID, host group ID, and port to the VSM resource group.

If you want to use Virtual Storage Scale Out, see [Using Virtual Storage Scale Out \(VSSO\) \(on page 155\)](#).

**Note:**

- If the automatic selection of a storage system is specified (default), a storage system that has a pool whose usage rate is low and which satisfied the following conditions is automatically selected.
 - When Disk Type is specified: A Pool configured with the specified Disk Type (if multiple items are selected, they will be selected within that range)
 - When using Performance data for provisioning is specified: the pool must have a BusyRate that is less than the specified Pool BusyRate. If there is no pool that satisfies the specified Pool BusyRate, the pool candidate is not excluded by BusyRate.
- If the automatic selection of a storage system is specified (default), an LDEV and a Host Group are automatically created in meta_resource.
- If an LDEV is to be created on a VSM, the user must select the VSM (resource group) on which the LDEV is to be created.

Allocate Volumes with 2DC Remote Replication**Software prerequisites**

- Ops Center API Configuration Manager v10.7.0-00 or later
- Network management software
 - Brocade Network Advisor (BNA) 14.2, 14.4
 - or
 - Data Center Network Manager (DCNM) 7.1, 11.5

Setup prerequisites

- Set up remote paths between the primary and secondary storage systems using the Fibre Channel or iSCSI.
- When using Universal Replicator, create a journal and add a journal volume to it.
- Register the LDEV ID, the port, and the Host Group ID used by this service to the same resource group.
- Create at least one Web Service connection for the Ops Center API Configuration Manager server.
- Use the same credentials for each storage system managed by the Ops Center API Configuration Manager server registered in Web Service Connections.
- The ports used by Configuration Manager for communications between the primary and secondary sites must be open when a remote copy is performed. For details, see "Ports used during remote copy operations" in the *Hitachi Ops Center API Configuration Manager REST API Reference Guide*.

- Verify that the common credentials used to access all storage systems are assigned the following roles:
 - Storage Administrator (Provisioning)
 - Storage Administrator (Remote Copy)
 - Security Administrator (View & Modify)
- Create a web service connection for the BNA or DCNM server.
- For BNA, verify that the registered user is assigned one of the following roles:
 - SAN System Administrator
 - Zone Administrator
- For DCNM, verify that the registered user is assigned the network-admin role.

Allocate Volumes, Fabric, and Datastore for ESXi Host

Software prerequisites

- Ops Center API Configuration Manager v10.7.0-00 or later
- When integrating with Cisco FC switches: Data Center Network Manager (DCNM) 7.1, 11.5
- When integrating with Brocade FC switches: Fabric OS (FOS) 8.2.2d, 8.2.3a, 8.2.3c1, 9.0.1b, 9.0.1e1, 9.1.0b
- Virtualization software
 - VMWare vCenter Server
 - VMware vSphere Hypervisor (ESXi)
 - Python

For more information, refer to [Combinations of supported versions of VMware vCenter Server, VMware vSphere Hypervisor \(ESXi\), Python, and Python libraries \(on page 145\)](#) below.

Setup prerequisites

- Properly connect the storage system and hosts in SAN and verify that they belong to the correct fabric.
- Verify that the storage ports and HBA ports that are used by this service template belong to the fabric.
- The Web Service Connection is created for the VMware vCenter Server.
- At least one Web Service Connection is created for the Ops Center API Configuration Manager server.

- Create one web service connection for the Ops Center API Configuration Manager that uses the same credentials for each storage system managed by the Configuration Manager. Ensure that the credentials for accessing all storage systems are assigned the following roles:
 - Security Administrator (View & Modify)
 - Storage Administrator (Provisioning)
- Create a web service connection for DCNM or FOS.
- For FOS, the user ID cannot be a user using RADIUS/LDAP access authentication.
- For FOS, verify the following:
 - FOS REST API is enabled.
 - Fabric name is set.
 - Ops Center Automator and FC switches are in the same LAN.
 - Ops Center Automator and FC switches are not connected via a proxy.
- For DCNM, verify that the registered user is assigned the network-admin role.
- For FOS, verify that the registered user is assigned the following roles:
 - For the default Fabric OS roles one of the following roles is required:
 - Admin
 - FabricAdmin
 - ZoneAdmin
 - For user-defined roles, a role with both of the following permissions is required:
 - Fabric=O(Observe) or OM(Observe and Modify)
 - Zoning=OM(Observe and Modify)
- For switches with VirtualFabric feature enabled, the Virtual Fabric ID of the fabric to be operated is included in the Role-LF List for the user ID.
- When allocating volumes in VSM, add LDEV ID, host group ID, and Port to the VSM resource group.
- Specify the python execution path in the shared properties of the Python Interpreter Path in the Administration tab.
- If LIP reset is enabled, register all ESXi server information with login credentials as Agentless Remote Connections in the Administration tab.
- When specifying email addresses in Notification Settings, configure SMTP settings in the Administration Tab and verify that the SMTP server is accessible from the Ops Center Automator server.
- When specifying the datastore cluster to which to add the datastores you are creating, you must first create the datastore cluster.
- Disable storage DRS before using this service template. Adding a Datastore into a Datastore cluster can fail when Storage DRS is enabled.

**Note:**

- You must import the VMware vCenter Server root certificates into the OS truststore and the Ops Center Automator truststore. Detailed information is provided in the *Hitachi Ops Center Automator Installation and Configuration Guide*.
- If the automatic selection of a storage system is specified (default), a storage system that has a pool whose usage rate is low is automatically selected.
- If the automatic selection of a storage system is specified (default), an LDEV and a Host Group are automatically created in meta_resource.
- If an LDEV is to be created on a VSM, the user must select the VSM (resource group) on which the LDEV is to be created.
- When you use LIP reset, if the ESXi host has an existing datastore, I/O to the existing datastore might be stopped.

Allocate Volumes with Remote Replication (Global-Active Device)**Software prerequisites**

- Ops Center API Configuration Manager v10.7.0-00 or later
- Network Management Software
 - Brocade Network Advisor (BNA) 14.2, 14.4
 - or
 - Data Center Network Manager (DCNM) 7.1, 11.5

Setup prerequisites

- Set up remote paths between the primary and secondary storage systems using the Fibre Channel or iSCSI.
- Create a virtual storage machine (VSM) on the secondary storage system. Add resources such as host group IDs and LDEV IDs to the resource group that is created for the virtual storage machine.
- Map the Quorum disk on the external storage system to the primary and secondary storage systems. Quorum disks without LDEV are not supported.
- Register the LDEV ID, the Port, and the Host Group ID used by this service to the same resource group.
- Create at least one Web Service connection for the Ops Center API Configuration Manager server.
- The ports used by Configuration Manager for communications between the primary and secondary sites must be open when a remote copy is performed. For details, see "Ports used during remote copy operations" in the *Hitachi Ops Center API Configuration Manager REST API Reference Guide*.

- Create one web service connection for the Ops Center API Configuration Manager that uses the same credentials for each storage system managed by the Ops Center API Configuration Manager. In addition to using the same credentials to access all storage systems, ensure that these credentials are assigned the following roles:
 - Security Administrator (View & Modify)
 - Storage Administrator (Provisioning)
 - Storage Administrator (Remote Copy)
- Create a web service connection for the BNA or DCNM server.
- For BNA, verify that the registered user is assigned one of the following roles:
 - SAN System Administrator
 - Zone Administrator
- For DCNM, verify that the registered user is assigned the network-admin role.

Allocate Fabric Aware Volumes and Create Datastore for ESX Cluster

Software prerequisites

- Ops Center API Configuration Manager v10.7.0-00 or later.
- When integrating with Brocade FC switches: Fabric OS (FOS) 8.2.2d, 8.2.3a, 8.2.3c1, 9.0.1b, 9.0.1e1, 9.1.0b
- Virtualization software
 - VMWare vCenter Server
 - VMware vSphere Hypervisor (ESXi)
 - Python

For more information, refer to [Combinations of supported versions of VMware vCenter Server, VMware vSphere Hypervisor \(ESXi\), Python, and Python libraries \(on page 145\)](#) below.

Setup prerequisites

- Create a datastore cluster.
- Connect the storage system and hosts to the SAN and verify that they belong to the correct fabric.
- Create a storage pool.
- Disable storage DRS before using this service template. Adding a Datastore into a Datastore cluster can fail when Storage DRS is enabled.
- When specifying email addresses in Notification Settings, configure the SMTP settings in the Administration Tab and verify that the SMTP server is accessible from the Ops Center Automator server.
- If LIP reset is enabled, register all ESX server information with login credentials as Agentless Remote Connections in the Administration Tab.
- Create an ESX cluster.

- Add hosts to the ESX cluster.
- Verify that all storage ports and HBA ports, which are used by this service template, belong to the fabric.
- When allocating volumes in VSM, add all required resources such as LDEV ID and host group ID to the VSM resource group.
- Register Ops Center API Configuration Manager in Ops Center Automator.
- Verify that the common credentials used to access all storage systems are assigned the following roles:
 - Security Administrator (View & Modify)
 - Storage Administrator (Provisioning)
- Register VMware vCenter Server in Ops Center Automator.
- Create a web service connection for FOS.
- For FOS, the user ID cannot be a user using RADIUS/LDAP access authentication.
- For FOS, verify the following:
 - FOS REST API is enabled.
 - Fabric name is set.
 - Ops Center Automator and FC switches are in the same LAN.
 - Ops Center Automator and FC switches are not connected via a proxy.
- For FOS, verify that the registered user is assigned the following roles:
 - For the default Fabric OS roles one of the following roles is required:
 - Admin
 - FabricAdmin
 - ZoneAdmin
 - For user-defined roles, a role with both of the following permissions is required:
 - Fabric=O(Observe) or OM(Observe and Modify)
 - Zoning=OM(Observe and Modify)
- For Brocade FC switches with VirtualFabric feature enabled, the Virtual Fabric ID of the fabric to be operated is included in the Role-LF List for the user ID.
- Register the storage system in Ops Center API Configuration Manager.
- Specify the python execution path in the shared properties of the Python Interpreter Path in the Administration Tab.



Note: You must import the VMware vCenter Server root certificates into the OS truststore and the Ops Center Automator truststore. Detailed information is provided in the *Hitachi Ops Center Automator Installation and Configuration Guide*.



Note: Users are required to have the following privileges.

Users registered in Web Service Connections (vCenter Category):

- Datastore
 - Allocate space
 - Browse datastore
 - Configure datastore
 - Low level file operations
 - Move datastore
- Folder
 - Create folder
- Host
 - Configuration
 - Change settings
 - Storage partition configuration
- Tasks
 - Create task

Users registered in Agentless Remote Connections are required to have the Admin role.



Note: This service does not support VMware Hyperconverged infrastructure (HCI) clusters.

Add Host to Cluster in vCenter

Software prerequisites

- Ops Center API Configuration Manager v10.7.0-00 or later.
- When integrating with Brocade FC switches: Fabric OS (FOS) 8.2.2d, 8.2.3a, 8.2.3c1, 9.0.1b, 9.0.1e1, 9.1.0b
- Virtualization software
 - VMWare vCenter Server
 - VMware vSphere Hypervisor (ESXi)
 - Python

For more information, refer to [Combinations of supported versions of VMware vCenter Server, VMware vSphere Hypervisor \(ESXi\), Python, and Python libraries \(on page 145\)](#) below.

Setup prerequisites

- Create an ESX cluster.
- Add hosts to the ESX cluster.
- Verify that all storage ports and HBA ports, which are used by this service template, belong to the fabric.
- When allocating volumes in VSM, add all required resources such as LDEV ID and host group ID to the VSM resource group.
- Register Ops Center API Configuration Manager in Ops Center Automator.
- Register VMware vCenter Server in Ops Center Automator.
- Create a web service connection for FOS.
- For FOS, the user ID cannot be a user using RADIUS/LDAP access authentication.
- For FOS, verify the following:
 - FOS REST API is enabled.
 - Fabric name is set.
 - Ops Center Automator and FC switches are in the same LAN.
 - Ops Center Automator and FC switches are not connected via a proxy.
- For FOS, verify that the registered user is assigned the following roles:
 - For the default Fabric OS roles one of the following roles is required:
 - Admin
 - FabricAdmin
 - ZoneAdmin
 - For user-defined roles, a role with both of the following permissions is required:
 - Fabric=O(Observe) or OM(Observe and Modify)
 - Zoning=OM(Observe and Modify)
- For Brocade FC switches with VirtualFabric feature enabled, the Virtual Fabric ID of the fabric to be operated is included in the Role-LF List for the user ID.
- Register all storage systems in Ops Center API Configuration Manager.
- Properly connect the storage system and hosts in SAN and verify that they belong to the correct fabric.
- Verify that the common credentials used to access all storage systems are assigned the following roles:
 - Security Administrator (View & Modify)
 - Storage Administrator (Provisioning)



Note: You must import the VMware vCenter Server root certificates into the OS truststore and the Ops Center Automator truststore. Detailed information is provided in the *Hitachi Ops Center Automator Installation and Configuration Guide*.



Note: This service does not support VMware Hyperconverged infrastructure (HCI) clusters.

Remove Host from Cluster in vCenter

Software prerequisites

- Ops Center API Configuration Manager v10.7.0-00 or later.
- When integrating with Brocade FC switches: Fabric OS (FOS) 8.2.2d, 8.2.3a, 8.2.3c1, 9.0.1b, 9.0.1e1, 9.1.0b
- Virtualization software
 - VMWare vCenter Server
 - VMware vSphere Hypervisor (ESXi)
 - Python

For more information, refer to [Combinations of supported versions of VMware vCenter Server, VMware vSphere Hypervisor \(ESXi\), Python, and Python libraries \(on page 145\)](#) below.

Setup prerequisites

- Create an ESX cluster.
- Add hosts to the ESX cluster.
- Verify that all storage ports and HBA ports, which are used by this service template, belong to the fabric.
- When allocating volumes in VSM, add all required resources such as LDEV ID and host group ID to the VSM resource group.
- Register Ops Center API Configuration Manager in Ops Center Automator.
- Register VMware vCenter Server in Ops Center Automator.
- Create a web service connection for FOS.
- For FOS, the user ID cannot be a user using RADIUS/LDAP access authentication.
- For FOS, verify the following:
 - FOS REST API is enabled.
 - Fabric name is set.
 - Ops Center Automator and FC switches are in the same LAN.
 - Ops Center Automator and FC switches are not connected via a proxy.

- For FOS, verify that the registered user is assigned the following roles:
 - For the default Fabric OS roles one of the following roles is required:
 - Admin
 - FabricAdmin
 - ZoneAdmin
 - For user-defined roles, a role with both of the following permissions is required:
 - Fabric=O(Observe) or OM(Observe and Modify)
 - Zoning=OM(Observe and Modify)
- For Brocade FC switches with VirtualFabric feature enabled, the Virtual Fabric ID of the fabric to be operated is included in the Role-LF List for the user ID.
- Register all storage systems in Ops Center API Configuration Manager.
- Verify that the common credentials used to access all storage systems are assigned the following roles:
 - Security Administrator (View & Modify)
 - Storage Administrator (Provisioning)
- When you select the maintenance mode check box, verify the DRS setting. If DRS is disabled, the task of entering maintenance mode is not completed until all virtual machines that are running on a host are shut down or moved to other hosts manually. If DRS is enabled, virtual machines are moving automatically by DRS.
- Make sure that no virtual machines are running on a host that resides on the datastore:
 - Make sure that the Storage DRS does not manage the datastore.
 - Make sure that Storage I/O Control is disabled for the datastore.
 - Make sure that the datastore is not used by vSphere HA Heartbeating.
- Properly connect the storage system and hosts in SAN and verify that they belong to the correct fabric.



Note: You must import the VMware vCenter Server root certificates into the OS truststore and the Ops Center Automator truststore. Detailed information is provided in the *Hitachi Ops Center Automator Installation and Configuration Guide*.



Note: This service does not support VMware Hyperconverged infrastructure (HCI) clusters.

Global-Active Device Setup

Software prerequisites

Ops Center API Configuration Manager v10.7.0-00 or later

Setup prerequisites

- Create an external volume to use as a Quorum Disk, and register it in Primary and Secondary Storage.
- Prepare ports for the remote path.

Prepare a minimum of two ports for the remote path for Primary Storage and Secondary Storage.

- For VSP G1000, VSP G1500, and VSP F1500, prepare one MCU port and one RCU port.
- For VSP 5000 series models, VSP Gx00 models, VSP Fx00 models, VSP N series models, and VSP E series models, you can share an MCU/RCU/Target/Initiator port by setting the port attribute to bidirectional mode, but you should prepare a dedicated port to avoid migration performance degradation.
- Set the zone between the ports.



Note: You cannot create remote paths using the iSCSI port.

- Host Group (optional)

Create a Host Group to use for Command Device allocation and register the pair management server WWN.

When creating a path with this service, the host and storage port are created individually, but to control how to create a path (for example, to create it with Full Mesh), create a Host Group beforehand and when you are in the Existing Host Group/iSCSI Target in the Edit/Config window, select the Host Group you created.

- Create a web service connection for the Ops Center API Configuration Manager that uses the same credentials for each storage system managed by Ops Center API Configuration Manager.
- Verify that the common credentials used to access all storage systems are assigned the following roles:
 - Security Administrator (View & Modify)
 - Storage Administrator (Provisioning)

Create Online Migration Pair**Software prerequisites**

- Ops Center API Configuration Manager v10.7.0-00 or later
- When integrating with Cisco FC switches:
 - Data Center Network Manager (DCNM) 7.1, 11.5
- When integrating with Brocade FC switches:
 - Fabric OS (FOS) 8.2.2d, 8.2.3a, 8.2.3c1, 9.0.1b, 9.0.1e1, 9.1.0b
- Ops Center Administrator v10.1.0-00 or later

Setup prerequisites

- At least one remote path using FC or iSCSI has been defined for the storage systems of the migration source and the migration target used in this service.
- The path group, including the previous remote path, has been set up.
- A pool has been created in the migration target storage system.
- A VSM in the migration target storage system has been duplicated from the VSM (resource group) in the migration source volume.
- At least one Configuration Manager server has been added to Web Service Connection.
- The storage systems registered in Configuration Manager have the same credentials.
- Each source/target storage system must not be registered in more than one Configuration Manager.
- The ports used by Configuration Manager for communications between the primary and secondary sites must be open when a remote copy is performed. For details, see "Ports used during remote copy operations" in the *Hitachi Ops Center API Configuration Manager REST API Reference Guide*.
- Verify that the common credentials used to access all storage systems are assigned the following roles:
 - Security Administrator (View & Modify)
 - Storage Administrator (Provisioning)
 - Storage Administrator (Remote Copy)
 - Storage Administrator (Initial Configuration)
- The migration source volumes must not have any remote copy pairs configured.
- Create a web service connection for DCNM or FOS.
- For FOS, the user ID cannot be a user using RADIUS/LDAP access authentication.
- For FOS, verify the following:
 - FOS REST API is enabled.
 - Fabric name is set.
 - Ops Center Automator and FC switches are in the same LAN.
 - Ops Center Automator and FC switches are not connected via a proxy.
- For FOS, verify that the registered user is assigned the following roles:
 - For the default Fabric OS roles one of the following roles is required:
 - Admin
 - FabricAdmin
 - ZoneAdmin
- For user-defined roles, a role with both of the following permissions is required:
 - Fabric=O(Observe) or OM(Observe and Modify)
 - Zoning=OM(Observe and Modify)

- For Brocade FC switches with VirtualFabric feature enabled, the Virtual Fabric ID of the fabric to be operated is included in the Role-LF List for the user ID.
- For DCNM, verify that the registered user is assigned the network-admin role.

If you want to run multiple tasks concurrently, see [Running multiple tasks \(on page 160\)](#).

Create Online Migration Pair for Multiple Hosts

Software prerequisites

- Ops Center API Configuration Manager v10.7.0-00 or later
- When integrating with Cisco FC switches:
Data Center Network Manager (DCNM) 7.1, 11.5
- When integrating with Brocade FC switches:
Fabric OS (FOS) 8.2.2d, 8.2.3a, 8.2.3c1, 9.0.1b, 9.0.1e1, 9.1.0b
- Ops Center Administrator v10.7.0-00 or later

Setup prerequisites

- The Create Online Migration Pairs for Multiple Hosts must be the same version (VV.RR) as the Create Online Migration Pair service.
- When multiple hosts are selected, they must not have the same volume allocated to them.
- At least one remote path using FC or iSCSI has been defined for the storage systems of the migration source and the migration target used in this service.
- The path group, including the previous remote path, has been set up.
- A pool has been created in the migration target storage system.
- A VSM in the migration target storage system has been duplicated from the VSM (resource group) in the migration source volume.
- At least one Configuration Manager server has been added to Web Service Connection.
- The storage systems registered in Configuration Manager have the same credentials.
- Verify that the common credentials used to access all storage systems are assigned the following roles:
 - Security Administrator (View & Modify)
 - Storage Administrator (Provisioning)
 - Storage Administrator (Remote Copy)
 - Storage Administrator (Initial Configuration)
- The migration source volumes must not have any remote copy pairs configured.
- Each source/target storage system must not be registered in more than one Configuration Manager.

- The ports used by Configuration Manager for communications between the primary and secondary sites must be open when a remote copy is performed. For details, see "Ports used during remote copy operations" in the *Hitachi Ops Center API Configuration Manager REST API Reference Guide*.
- The migration source volumes must not have any remote copy pairs configured.
- Create a web service connection for DCNM or FOS.
- For FOS, the user ID cannot be a user using RADIUS/LDAP access authentication.
- For FOS, verify the following:
 - FOS REST API is enabled.
 - Fabric name is set.
 - Ops Center Automator and FC switches are in the same LAN.
 - Ops Center Automator and FC switches are not connected via a proxy.
- For FOS, verify that the registered user is assigned the following roles:
 - For the default Fabric OS roles one of the following roles is required:
 - Admin
 - FabricAdmin
 - ZoneAdmin
 - For user-defined roles, a role with both of the following permissions is required:
 - Fabric=O(Observe) or OM(Observe and Modify)
 - Zoning=OM(Observe and Modify)
- For Brocade FC switches with VirtualFabric feature enabled, the Virtual Fabric ID of the fabric to be operated is included in the Role-LF List for the user ID.
- For DCNM, verify that the registered user is assigned the network-admin role.
- If you already have Ops Center Administrator installed, you must import the Ops Center Administrator server certificate in the Ops Center Automator truststore, to use the host selection feature.
- If you enable the Use Diskless Quorum option, an unused common Quorum ID must exist for both the source and target.
- If you do not enable the Use Diskless Quorum option, you must create a Quorum disk to be used with global-active device.

If you want to run multiple tasks concurrently, see [Running multiple tasks \(on page 160\)](#).

Migrate Data for Online Migration Pair

Software prerequisites

Setup prerequisites

- Submit the service as a user with the same permissions as the user who submitted the Create Online Migration Pair service.
- The target storage systems scheduled for migration must be registered in the same API Configuration Manager that was used when running the Create Online Migration Pair service and the API Configuration Manager must be registered in Web Service Connections.
- Each source/target storage system must not be registered in more than one Configuration Manager.
- The ports used by Configuration Manager for communications between the primary and secondary sites must be open when a remote copy is performed. For details, see "Ports used during remote copy operations" in the *Hitachi Ops Center API Configuration Manager REST API Reference Guide*.
- After the Create Online Migration Pair task that you select in the Edit/Submit Service window completes, you cannot make any changes to the configuration of the target resources before running the task.
- The migration source volumes must not have any remote copy pairs configured.

If you want to run multiple tasks concurrently, see [Running multiple tasks \(on page 160\)](#).

Clean up Online Migration Pair**Software prerequisites**

- Ops Center API Configuration Manager v10.7.0-00 or later
- Ops Center API Configuration Manager v10.7.0-00 or later

Setup prerequisites

- Submit the service as a user with the same permissions as the user who submitted the Create Online Migration Pair service.
- The target storage systems scheduled for cleanup must be registered in the same API Configuration Manager that was used when running the Create Online Migration Pair service and the API Configuration Manager must be registered in Web Service Connections.
- Each source/target storage system must not be registered in more than one Configuration Manager.
- The ports used by Configuration Manager for communications between the primary and secondary sites must be open when a remote copy is performed. For details, see "Ports used during remote copy operations" in the *Hitachi Ops Center API Configuration Manager REST API Reference Guide*.
- If you want to clean up a failed task due to an error instead of the task that was completed, remove the cause of the error and then submit the service.

- After the Create Online Migration Pair task that you select in the Edit/Submit Service window completes or fails, you cannot make any changes to the configuration of the target resources before running the task.
- If you want to run multiple tasks concurrently, see [Running multiple tasks \(on page 160\)](#).

ServiceNow

Ops Center Automator has the following service templates for ServiceNow

- Create ServiceNow Incident Ticket
- Retrieve ServiceNow Incident Tickets
- Call ServiceNow Table API
- Update ServiceNow Incident Ticket

Software prerequisites

ServiceNow version: Utah, Vancouver, Washington DC

Setup prerequisites

Register the ServiceNow Web Service Connection in Ops Center Automator.

Combinations of supported versions of VMware vCenter Server, VMware vSphere Hypervisor (ESXi), Python, and Python libraries

VMware vCenter Server and VMware vSphere Hypervisor (ESXi)	Python	Python library
7.0 U1, 7.0 U2, 7.0 U3	3.8	<ul style="list-style-type: none"> ▪ certifi 2021.10.8 ▪ charset-normalizer 2.0.8 ▪ idna 3.3 ▪ pyvmomi 7.0.3 ▪ requests 2.26.0 ▪ six 1.16.0 ▪ urllib3 1.26.7
	3.9, 3.10, 3.11	<ul style="list-style-type: none"> ▪ certifi 2022.6.15 ▪ charset-normalizer 2.0.12 ▪ idna 3.3 ▪ pyvmomi 7.0.3 ▪ requests 2.28.0 ▪ six 1.16.0 ▪ urllib3 1.26.9

VMware vCenter Server and VMware vSphere Hypervisor (ESXi)	Python	Python library
	3.12	<ul style="list-style-type: none"> certifi 2023.5.7 charset-normalizer 2.0.12 idna 3.4 pyvmomi 8.0.2.0.1 requests 2.31.0 six 1.16.0 urllib3 2.0.3

Service template supported platforms

The following is a list of Ops Center Automator templates with the platforms each supports.



Note: NVMe mode for Fibre Channel ports is not supported. When you submit a service against a storage systems with these ports, only the Fibre Channel ports with SCSI mode are handled.



Note: You must use a Configuration Manager version that supports the storage systems and the target features you are using.



Note: Be aware of the following when performing a Data In Place upgrade on storage systems.

- After a Data In Place upgrade, the storage model displayed in the Administration > Configuration Manager Settings window will show the model before the Data In Place upgrade until the storage system is re-registered in Ops Center API Configuration Manager. To display the model name after the Data In Place upgrade is complete, delete the relevant storage system from Ops Center API Configuration Manager in Local Storage Systems and Remote Storage Systems, and then re-register it.
- Do not run any task against the storage system during a Data In Place upgrade. If a task is run during a Data In Place upgrade, then the task fails. To recover, delete the resources created by the task after the Data In Place upgrade is complete, and then resubmit the task.

Allocate Fabric Aware Volumes with Configuration Manager

This template supports the following platforms:

Models with Fibre Channel and iSCSI as the supported interface between host and storage system:

- Virtual Storage Platform G200, G350, G370, G400, G600, G700, G800, G900, G1000, G1500
- Virtual Storage Platform F350, F370, F400, F600, F700, F800, F900, F1500
- Virtual Storage Platform N400, N600, N800
- Virtual Storage Platform E590, E790, E990, E1090, E590H, E790H, E1090H
- Virtual Storage Platform 5100, 5200, 5500, 5600, 5100H, 5200H, 5500H, 5600H
- Virtual Storage Platform One Block 24, 26, 28

Allocate Volumes with Clone/Snapshot

This template supports the following platforms:

Models with Fibre Channel and iSCSI as the supported interface between host and storage system:

- Virtual Storage Platform G200, G350, G370, G400, G600, G700, G800, G900, G1000, G1500
- Virtual Storage Platform F350, F370, F400, F600, F700, F800, F900, F1500
- Virtual Storage Platform N400, N600, N800
- Virtual Storage Platform E590, E790, E990, E1090, E590H, E790H, E1090H
- Virtual Storage Platform 5100, 5200, 5500, 5600, 5100H, 5200H, 5500H, 5600H
- Virtual Storage Platform One Block 24, 26, 28

Allocate Volumes with Smart Provisioning

This template supports the following platforms:

Models with Fibre Channel and iSCSI as the supported interface between host and storage system:

- Virtual Storage Platform G200, G350, G370, G400, G600, G700, G800, G900, G1000, G1500
- Virtual Storage Platform F350, F370, F400, F600, F700, F800, F900, F1500
- Virtual Storage Platform N400, N600, N800
- Virtual Storage Platform E590, E790, E990, E1090, E590H, E790H, E1090H
- Virtual Storage Platform 5100, 5200, 5500, 5600, 5100H, 5200H, 5500H, 5600H
- Virtual Storage Platform One Block 24, 26, 28



Note: When you select "Virtual Storage Machine" for the Select from option on the Allocate Volumes with Smart Provisioning service, the following platforms are required:

- VSP G1000, VSP G1500, and VSP F1500
- VSP G200, G400, G600, G800, VSP F400, F600, F800 version 83-05-49-X0/00 or later, or 83-06-21-X0/00 or later
- Virtual Storage Platform G/F350, G/F370, G/F700, G/F900 version 88-08-11-X0/00 or later
- Virtual Storage Platform E990
- Virtual Storage Platform E590, E790, E1090, E590H, E790H, E1090H version 93-07-21-X0/00 or later
- Virtual Storage Platform N400, N600, N800 version 83-06-21-X0/00 or later
- Virtual Storage Platform 5100, 5200, 5500, 5600, 5100H, 5200H, 5500H, 5600H
- Virtual Storage Platform One Block 24, 26, 28

Allocate Volumes with 2DC Remote Replication

This template supports the following platforms:

- Virtual Storage Platform G200, G350, G370, G400, G600, G700, G800, G900, G1000, G1500
- Virtual Storage Platform F350, F370, F400, F600, F700, F800, F900, F1500
- Virtual Storage Platform N400, N600, N800
- Virtual Storage Platform E590, E790, E990, E1090, E590H, E790H, E1090H
- Virtual Storage Platform 5100, 5200, 5500, 5600, 5100H, 5200H, 5500H, 5600H
- Virtual Storage Platform One Block 24, 26, 28

Virtual models:

- Virtual Storage Platform G200, G350, G370, G400, G600, G700, G800, G900, G1000, G1500
- Virtual Storage Platform F350, F370, F400, F600, F700, F800, F900, F1500
- Virtual Storage Platform N400, N600, N800
- Virtual Storage Platform E590, E790, E990, E1090, E590H, E790H, E1090H
- Virtual Storage Platform 5100, 5200, 5500, 5600, 5100H, 5200H, 5500H, 5600H
- Virtual Storage Platform One Block 24, 26, 28

Allocate Volumes with Remote Replication (Global-Active Device)

This template supports the following platforms:

Models with Fibre Channel and iSCSI as the supported interface between the host and the storage system:

- Virtual Storage Platform G200, G350, G370, G400, G600, G700, G800, G900, G1000, G1500
- Virtual Storage Platform F350, F370, F400, F600, F700, F800, F900, F1500
- Virtual Storage Platform N400, N600, N800
- Virtual Storage Platform E590, E790, E990, E1090, E590H, E790H, E1090H
- Virtual Storage Platform 5100, 5200, 5500, 5600, 5100H, 5200H, 5500H, 5600H
- Virtual Storage Platform One Block 24, 26, 28

ESX Cluster service templates

This group of service templates include the following:

- Allocate Fabric Aware Volumes and Create Datastore for ESX Cluster
- Add Host to Cluster in vCenter
- Remove Host from Cluster in vCenter

These templates support the following platforms:

- Virtual Storage Platform G200, G350, G370, G400, G600, G700, G800, G900, G1000, G1500
- Virtual Storage Platform F350, F370, F400, F600, F700, F800, F900, F1500
- Virtual Storage Platform N400, N600, N800
- Virtual Storage Platform E590, E790, E990, E1090, E590H, E790H, E1090H
- Virtual Storage Platform 5100, 5200, 5500, 5600, 5100H, 5200H, 5500H, 5600H
- Virtual Storage Platform One Block 24, 26, 28

Virtual models:

- Virtual Storage Platform G200, G350, G370, G400, G600, G700, G800, G900, G1000, G1500
- Virtual Storage Platform F350, F370, F400, F600, F700, F800, F900, F1500
- Virtual Storage Platform N400, N600, N800
- Virtual Storage Platform E590, E790, E990, E1090, E590H, E790H, E1090H
- Virtual Storage Platform 5100, 5200, 5500, 5600, 5100H, 5200H, 5500H, 5600H
- Virtual Storage Platform One Block 24, 26, 28

ESXi Host service templates

This includes the following template:

- Allocate Volumes, Fabric, and Datastore for ESXi Host

This template supports the following platforms:

- Virtual Storage Platform G200, G350, G370, G400, G600, G700, G800, G900, G1000, G1500
- Virtual Storage Platform F350, F370, F400, F600, F700, F800, F900, F1500
- Virtual Storage Platform N400, N600, N800
- Virtual Storage Platform E590, E790, E990, E1090, E590H, E790H, E1090H
- Virtual Storage Platform 5100, 5200, 5500, 5600, 5100H, 5200H, 5500H, 5600H
- Virtual Storage Platform One Block 24, 26, 28

Virtual models:

- Virtual Storage Platform G200, G350, G370, G400, G600, G700, G800, G900, G1000, G1500
- Virtual Storage Platform F350, F370, F400, F600, F700, F800, F900, F1500
- Virtual Storage Platform N400, N600, N800
- Virtual Storage Platform E590, E790, E990, E1090, E590H, E790H, E1090H
- Virtual Storage Platform 5100, 5200, 5500, 5600, 5100H, 5200H, 5500H, 5600H
- Virtual Storage Platform One Block 24, 26, 28

Global-Active Device Setup service template

The template supports the following platforms:

- VSP G1000, VSP G1500, and VSP F1500 version 80-06-2X-XX/XX or later
- VSP G200, G400, G600, G800, VSP F400, F600, F800 version 83-05-2X-XX/XX or later
- Virtual Storage Platform G/F350, G/F370, G/F700, G/F900 version 88-01-0X-XX/XX or later
- Virtual Storage Platform N400, N600, N800
- Virtual Storage Platform E590, E790, E990, E1090, E590H, E790H, E1090H
- Virtual Storage Platform 5100, 5200, 5500, 5600, 5100H, 5200H, 5500H, 5600H
- Virtual Storage Platform One Block 24, 26, 28

Online Migration with Configuration Manager service templates

This group of service templates include the following:

- Create Online Migration Pair service template
- Create Online Migration Pairs for Multiple Hosts service template
- Clean up Online Migration Pair service template
- Migrate Data for Online Migration Pair service template

The template supports the following platforms:

- VSP G1000, VSP G1500, and VSP F1500 version 80-06-80-00/02 or later
- VSP G200, G400, G600, G800, VSP F400, F600, F800 version 83-05-37-X0/00 or later, or 83-06-09-X0/00 or later
- Virtual Storage Platform G/F350, G/F370, G/F700, G/F900, version 88-06-02-X0/00 or later
- Virtual Storage Platform E990, version 93-02-03-X0/00 or later
- Virtual Storage Platform E590, E790, E590H, E790H, version 93-03-01-X0/00 or later
- Virtual Storage Platform E1090, E1090H version 93-06-01-01/00 or later
- Virtual Storage Platform N400, N600, N800 version 83-06-09-X0/00 or later
- Virtual Storage Platform 5100, 5500, 5100H, 5500H version 90-04-04-00/01 or later
- Virtual Storage Platform 5200, 5600, 5200H, 5600H version 90-08-01-00/00 or later
- Virtual Storage Platform One Block 24, 26, 28



Note: When you enable the Use Diskless Quorum option on the Create Online Migration Pair service or the Create Online Migration Pairs for Multiple Hosts service, the following platforms are required:

- VSP G1000, VSP G1500, and VSP F1500 version 80-06-86-00/00 or later
- VSP G200, G400, G600, G800, VSP F400, F600, F800 version 83-05-41-X0/00 or later
- Virtual Storage Platform G/F350, G/F370, G/F700, G/F900 version 88-08-02-X0/00 or later
- Virtual Storage Platform E990 version 93-04-02-X0/00 or later
- Virtual Storage Platform E590, E790, E590H, E790H, version 93-04-02-X0/00 or later
- Virtual Storage Platform E1090, E1090H version 93-06-01-01/00 or later
- Virtual Storage Platform N400, N600, N800 version 83-06-13-X0/00 or later
- Virtual Storage Platform 5100, 5500, 5100H, 5500H version 90-06-21-00/00 or later
- Virtual Storage Platform 5200, 5600, 5200H, 5600H version 90-08-01-00/00 or later
- Virtual Storage Platform One Block 24, 26, 28

Online Migration with Configuration Manager service templates - Storage systems support matrix

Target Source	VSP 5200, 5600, 5200H, 5600H	VSP 5100, 5500, 5100H, 5500H	VSP G1000, G1500, F1500	VSP One B26, B28	VSP One B24	VSP E1090, E1090H	VSP E990	VSP E790, E590, E790H, E590H	VSP F350, F370, F700, F900, G350, G370, G700, G900	VSP G200, G400, G600, G800, F400, F600, F800, N400, N600, N800
VSP 5200, 5600, 5200H, 5600H	Unsupported	Unsupported	Unsupported	Unsupported	Unsupported	Unsupported	Unsupported	Unsupported	Unsupported	Unsupported
VSP 5100, 5500, 5100H, 5500H	Supported	Supported	Unsupported	Unsupported	Unsupported	Unsupported	Unsupported	Unsupported	Unsupported	Unsupported
VSP G1000, G1500, F1500	Supported	Supported	Supported	Unsupported	Unsupported	Unsupported	Unsupported	Unsupported	Unsupported	Unsupported
VSP One B26, B28	Unsupported	Unsupported	Unsupported	Supported	Unsupported	Unsupported	Unsupported	Unsupported	Unsupported	Unsupported
VSP One B24	Unsupported	Unsupported	Unsupported	Unsupported	Unsupported	Unsupported	Unsupported	Unsupported	Unsupported	Unsupported
VSP E1090, E1090H	Unsupported	Unsupported	Unsupported	Unsupported	Unsupported	Supported	Unsupported	Unsupported	Unsupported	Unsupported
VSP E990	Unsupported	Unsupported	Unsupported	Unsupported	Unsupported	Supported	Unsupported	Supported	Unsupported	Unsupported
VSP E790, E590, E790H, E590H	Unsupported	Unsupported	Unsupported	Supported(*2)	Unsupported	Supported	Unsupported	Supported	Unsupported	Unsupported
VSP F350, F370, F700, F900, G350, G370, G700, G900	Unsupported	Unsupported	Unsupported	Supported(*2)	Supported(*3)	Supported (*1)	Supported	Supported	Supported	Unsupported
VSP G200, G400, G600, G800, F400, F600, F800, N400, N600, N800	Unsupported	Supported	Unsupported	Supported(*4)	Supported(*4)	Supported (*1)	Unsupported	Supported	Supported	Supported

**Note:**

*1: The following versions are required when used in combination with VSP E1090 and E1090H:

- For VSP G350, G370, G700, G900, VSP F350, F370, F700, F900: Version 88-08-04-X0/00 or later
- For VSP G200, G400, G600, G800, VSP F400, F600, F800, VSP N400, N600, N800: Version 83-05-43-X0/00 or later, or 83-06-15-X0/00 or later

*2: The following versions are required when used in combination with VSP One B26, VSP One B28:

- For VSP F350, F370, F700, F900, VSP G350, G370, G700, G900: Version 88-08-15-X0/80 or later
- For VSP E590, E790, E590H, E790H: Version 93-07-24-X0/00 or later

*3: The following versions are required when used in combination with VSP One B24

- For VSP F350, F370, F700, F900, VSP G350, G370, G700, G900: Version 88-08-15-xx/00 or later

*4: The following versions are required when used in combination with VSP One B24, VSP One B26, VSP One B28:

- For VSP G200, G400, G600, G800, VSP F400, F600, F800, and VSP N400, N600, N800: Version 83-06-25-x0/00 or later

ServiceNow Ticketing service templates

This group of templates include the following:

- Call ServiceNow Table API
- Create ServiceNow Incident Ticket
- Update ServiceNow Incident Ticket
- Retrieve ServiceNow Incident Tickets

No storage systems are required to use these service templates.

Using Brocade Fabric OS

The following are the operational requirements for using Brocade Fabric OS (FOS) with Ops Center Automator.

Changing Ops Center Automator server settings

You must change the following values in the `config_user.properties` file:

```
logger.TA.MaxFileSize: 100240
```

See "Changing the system configuration" in the *Hitachi Ops Center Automator Installation and Configuration Guide*.

Using in a mixed environment of Peer Zoning and Target Driven Zoning

How to avoid Peer Zoning

To ensure that the zone to be modified by Ops Center Automator does not become a Peer Zone, check the Zone name used in the existing Peer Zone and make sure it is different from the Zone name modified by Ops Center Automator.

Check the Script for Zone Naming setting in "Zone Settings" of the service.

If the existing Peer Zone might match the Zone name modified by Ops Center Automator, set the "Script for Zone Naming" in "Zone Settings" to a different name.

How to avoid Target Driven Zoning

Storage ports connected to Target Driven enabled switch ports must be excluded due to conflicting Zone creation feature.

Specify the storage ports connected to the switch port with Target Driven enabled to be excluded at "Storage Port" in "Resource Criteria" so that they are not used.

Service settings and upper limit in large-scale configurations

In large-scale configurations, the task might take a long time to run.

The following table shows the guideline for which the settings in this section are recommended and the upper limit for each item.

Item	Guideline	Upper limit
Number of Fabrics	-	48
Number of Member switches	100	200
Number of host and storage ports connected to Brocade FC switches	15,000	40,000

For a large-scale configuration that exceed the above guideline or if you feel the task takes a long time to run, setting the service in the following table narrows the search range to only the switches to be used, which can reduce the run time.

Navigation pane	Settings pane	To set
Volume Settings	Storage System Selection ¹	Manual
Volume Settings	Storage System ²	Storage system to be operated
Source Settings	Source Storage System ²	Storage system to be operated

Navigation pane	Settings pane	To set
Target Settings	Target Storage System ²	Storage system to be operated
Fabric Settings	Connections	Port search range Web Service Connection name of FOS_PrimarySwitch ³
Fabric Settings	Target Fabrics	Fabric names configured for the switch in the port search range ³ It is not required to be set in the environment that does not use Virtual Fabric.
<ol style="list-style-type: none"> 1. Specify only for the Allocate Volumes with Smart Provisioning and Allocate Volumes, Fabric, and Datastore for ESXi Host service templates. 2. Specify "Storage System" or "Source Storage System" and "Target Storage System" depending on the settings of the target service template. 3. If there is more than one fabric name, specify them separated by commas. 		

Upgrading existing service templates

If you used to use BNA for zoning configurations, you must configure Web Service Connections and edit the service after upgrading the service template to change the fabric management from BNA to FOS.

1. Configure a web service connection.

For more information, see [Configuring Web Service Connections \(on page 86\)](#).

2. Edit the service if the "Use Fabric Settings" option on "Fabric Settings" is enabled:
 - If "Target Fabrics" is specified, specify the fabric name set for the FC switch. If "Target Fabrics" is not specified, no editing is required.
 - Specify "FOS_PrimarySwitch" for Fabric Connection Type.
 - In Connections, specify the same name as the web service connection registered by selecting "FOS_PrimarySwitch" as the category. If Connections is not specified, no editing is required.

Using Virtual Storage Scale Out (VSSO)

Virtual Storage Scale Out (VSSO) is a scale-out feature that allows multiple physical storage systems to be handled as a single mass storage system by defining the common virtual storage machine (VSM) for multiple physical storage systems.

You can do the following in Ops Center Automator:

- Allocate volumes without being aware of the physical storage system configuration
- Perform migration for load balancing

Before you begin

- To perform migration for load balancing, you should ensure that virtual LDEV IDs are not duplicated in the VSM.
- There are prerequisites for the microcode version of the physical storage systems that comprise the VSM. See [Service template supported platforms \(on page 146\)](#) for details.
- There are prerequisites when the Select MPU/MPB based on utilization option is enabled. See [Prerequisites and precautions when using the "Select MPU/MPB based on utilization" option \(on page 159\)](#) for details.
- We recommend that the number of physical storage systems that comprise each VSM be 16 or less. Depending on the system configuration, the Virtual Storage Machine table might take some time to appear in the Edit Service and Submit Service Request windows of the Allocate Volumes with Smart Provisioning service.

Complete the following steps:

1. Determine the virtual model and virtual serial number of each VSM.
2. Create a VSM on each physical storage system by specifying the virtual model and virtual serial number determined in step 1. When the VSM is created, a resource group is also automatically created.



Tip: The Global-Active Device Setup service can be used to create a VSM.

You can create a common VSM on each physical storage system by submitting the service with the following settings:

- a. The first and second physical storage systems:
 - VSM Creation Type: "Create new VSMs on both the primary and secondary storage systems."
 - Virtual Model: The virtual model determined in step 1.
 - Virtual Serial Number: The virtual serial number determined in step 1.
 - b. The third and subsequent physical storage systems:
 - Primary Storage System: The physical storage system specified as the first or second.
 - Secondary Storage System: The physical storage system where to create a new VSM.
 - VSM Creation Type: "Duplicate the primary storage system VSM to the secondary storage system."
 - Virtual Storage Machine: The VSM created in step a.
3. Create a pool for each physical storage system.
 4. Consider and determine the range of virtual LDEV IDs to be assigned to each physical storage system that comprises the VSM so that there is no duplication among physical storage systems.

5. Create a web service connection for the Configuration Manager to be used, and register all physical storage systems that comprise the VSM to the Configuration Manager connection. Make sure that you select the Receive configuration-notifications from the storage system check box in the Register Local Storage System dialog box.
6. Determine the physical LDEV ID, port, and host group ID to be used for each physical storage system and add them to the VSM resource group.

Allocating volumes without being aware of the physical storage system configuration

You can allocate volumes without being aware of the physical storage system configuration by specifying a VSM and submitting the provisioning service.

1. Edit the provisioning service according to the following steps:
 - a. On the Services tab, select the Allocate Volumes with Smart Provisioning service, and click Edit.
 - b. In the Edit Service window, in the Settings pane, enter the following information:

Navigation pane	Settings pane	To set
Volume Settings	Configuration Manager Connection	The Configuration Manager Connection to use
	Storage System Selection	Automatic
	Select from	Virtual Storage Machine
	Virtual Storage Mapping Definition	Information of all VSMs, all physical storage systems that comprise each VSM, and the Virtual LDEV ID range for each VSM and physical storage system.

For details of the above parameter settings and other parameter settings, see [Allocate Volumes with Smart Provisioning: Service details \(on page 173\)](#) to enter the values.

- c. Click Save and Close.
2. Submit the provisioning service according to the following steps:
 - a. On the Services tab, select the service edited in step 1, and click Create Request.
 - b. In the Submit Service Request window, in the Settings pane, retain the values already entered and enter the following additional information:

Navigation pane	Settings pane	To set
Volume Settings	Virtual Storage Machine	The Virtual Storage Machine to use
	Volumes Settings	Modify the setting values to match the conditions of the volumes to be allocated
Host Settings	Number of Hosts	Single or Multiple, as desired
	Host Name	The name of the host to which you want to allocate volumes
	WWN Settings	WWN information to use
Task Settings	Task Name	The desired task name
	Description Name	The description of the task if required
	Schedule Type	Immediate or Schedule, as desired



Note: There must be only one resource group within the specified VSM for each physical storage system that comprise the VSM. If multiple resource groups are defined, the resource group with the minimum ID will be used.

- c. Click Submit and click OK in the Submit Service confirmation dialog box.
- d. On the Tasks tab, in the Tasks view, select the submitted task, then click Show Details to view the task running status. Once the task completes, volume allocation completes.

When you submit the "Allocate Volumes with Smart Provisioning" service and allocate shared volumes to multiple hosts by specifying a VSM, the pool for volumes allocated to the hosts might not be unified even if "Enabled" is specified for "Select the same storage system". This is because the pool for volumes is automatically determined from multiple pools based on usage status. To unify the pool used by the hosts, submit the service according to the following steps.

- If volumes are already allocated to multiple pools and the pools are not unified:
 1. Select all of the target multiple hosts, set the shared volume parameters in Volume Settings, and submit the "Allocate Volumes with Smart Provisioning" service.
 2. If there are volumes which you do not share, select each host, set the parameters for the volumes which you do not share in Volume Settings, and submit the "Allocate Volumes with Smart Provisioning" service.
- If you want to allocate new shared volumes:
 1. Select all of the target multiple hosts and submit the "Allocate Volumes with Smart Provisioning" service.
 2. If there are hosts that require allocating different volumes, submit the "Allocate Volumes with Smart Provisioning" service by specifying the target hosts.

Prerequisites and precautions when using the "Select MPU/MPB based on utilization" option

- When the option is enabled, Clear Sight 11.0.3-00 or later is required.
- For each VSM specified for volume allocation, all storage systems that comprise the VSM should be monitored performance by a single Analyzer. If data collection is disabled in Clear Sight, enable it by following the change-etl-config procedure in the *Hitachi Ops Center Analyzer Installation and Configuration Guide*.
- When the option is enabled, the load for all MPUs/MPBs is leveled. Since all MPUs/MPBs might be used for assignment, specific MPUs/MPBs cannot be excluded from assignment to a volume as a specific use.
- When the option is enabled, the storage system and MPU/MPB are determined based on the MPU/MPB utilization during the period specified for Performance evaluation window. If the specified period is short or there are many blank periods in the acquired data, the storage system and MPU/MPB might be determined based on performance data that is not sufficiently leveled.
- If there is a MPU/MPB that has failed or is being replaced, the MPU/MPB might fluctuate rapidly immediately after a failure recovery. It is necessary to run the task after the number of days specified for Performance evaluation window has elapsed.
- When volume allocation for many hosts is performed simultaneously, the MPU/MPB to be assigned is selected without the utilization of the allocated volumes being reflected in Clear Sight. We recommend that you start using the allocated volumes and allocate volumes to other hosts after some time.

Performing migration for load balancing

You can use the Nondisruptive Data Migration (NDM) services of Ops Center Automator to distribute the load of the physical storage systems that comprise the VSM.

1. Identify the physical storage systems and volumes that require load balancing, and determine the physical storage systems and pools to be migrated to.
2. Perform the migration by entering the information determined in step 1 into the NDM service. For details about using the NDM services, see [Online migration with Configuration Manager service templates \(on page 306\)](#).



Note: For load balancing, we recommend that you configure the service with the following settings:

- Delete the Host group: Disabled
- Delete the Volume: Enabled
- Set Host Mode Option 88 to Host Groups automatically: Disabled

Running multiple tasks

The service templates provided and preconfigured in Ops Center Automator allow only a single task to run at the same time and do not support running multiple tasks concurrently. However, the following service templates allow up to 25 tasks to run concurrently by satisfying the following additional prerequisites.

- Create Online Migration Pair
- Migrate Data for Online Migration Pair
- Clean up Online Migration Pair

For multiple runs, the Create Online Migration Pairs for Multiple Hosts service template can be used to run multiple Create Online Migration Pair tasks at once.

Software requirements for multiple runs

- Ops Center Administrator v10.7.0 or later (only required when you specify "Select Hosts" for the "Source Selection" property)

Setup requirements for multiple runs

- The Ops Center Automator server and Ops Center API Configuration Manager server must be on different servers.
- The migration source storage system must be the same storage system for all migration tasks to be run at the same time.
- The migration target storage system must be the same storage system for all migration tasks to be run at the same time.

Additional Ops Center Automator server settings

- The Ops Center Automator server must be set to “High performance mode”. For more information, refer to "Configuring the performance mode" in the *Hitachi Ops Center Automator Installation and Configuration Guide*.
- You must change the following values in the `config_user.properties` file:

```
plugin.threadPoolSize: 100
logger.TA.MaxFileSize: 100240
```

See "Changing the system configuration" in the *Hitachi Ops Center Automator Installation and Configuration Guide*.

Additional Ops Center API Configuration Manager server settings

- The communication mode must be “fcConnectionMode”. For details, see "Appendix A. Changing the communication mode of the REST API server" in the *Hitachi Ops Center API Configuration Manager REST API Reference Guide*.
- The setting for the number of storage systems to be managed must be “BalanceMode” or “HighPerformanceMode”. For more information, refer to "Setting the number of storage systems to be managed by the REST API" in the *Hitachi Ops Center API Configuration Manager REST API Reference Guide*.
- You must change the following values in `StartupV.properties`

```
rest.java.heapMemory.size: 6144
```

Refer to "Setting the java heap memory size on the Ops Center API Configuration Manager server" in the *Hitachi Ops Center Automator Installation and Configuration Guide* for more information.

- You must register a single Ops Center API Configuration Manager to be used in multiple runs as the notification destination of configuration changes in the migration source and target storage systems. See "Appendix D: Sending notifications about changes to storage system configurations" in the *Hitachi Ops Center API Configuration Manager REST API Reference Guide* for more information.

Requirements for the server where the Ops Center product is installed

Ops Center Automator must meet the system requirements described below in addition to the requirements described in the *Hitachi Ops Center Automator Installation and Configuration Guide*.

Table 5 Additional server requirements for Ops Center Automator

Item	Value
OS	Windows
CPU	8 Core or higher

Item	Value
Memory	16 GB or higher

The Ops Center API Configuration Manager must meet the system requirements described below in addition to the requirements described in "Hardware and disk space requirements" in the *Hitachi Ops Center API Configuration Manager System Requirements*.

Table 6 Additional server requirements for Ops Center API Configuration Manager

Item	Value
OS	Windows
CPU	4 Core or higher
Memory	8 GB or higher

Scale of resources to be migrated

The upper limit of resources to be migrated that can be specified when running multiple tasks is shown in below.

Table 7 Upper limit of resources to be migrated

Item	Upper limit value
Maximum number of hosts	Up to 25 hosts in total for multiple running tasks
Maximum number of volumes	Up to 500 volumes in total for multiple running tasks
Maximum number of volumes that can be selected in a single task	Up to 500 volumes
Maximum number of paths per volume	Up to 16 paths both before and after migration

You can specify up to 500 volumes for all running tasks, but the maximum number of initial copy pairs that can be run simultaneously in the storage system is 64 by default. The storage system will gradually perform initial copy as long as the maximum number of initial copies is not exceeded.

If you want to increase the number of initial copy pairs to be copied simultaneously, you must increase the maximum number of initial copies from the "Remote Replication Options" window in Storage Navigator. If the Diskless Quorum feature is not used, the maximum number of initial copies should not exceed 200, because the Quorum disk may not be able to handle it.

For details, refer to the Global-Active Device User Guide for each storage system.

Storage systems supporting multiple runs

You must use the following storage systems when you run multiple Online Migration with Configuration Manager tasks.

Storage systems with the Use Diskless Quorum option enabled:

- VSP G1000, VSP G1500, and VSP F1500: 80-06-86-00/00 or later
- VSP 5100, 5500, 5100H, 5500H: 90-06-21-00/00 or later
- VSP 5200, 5600, 5200H, 5600H: 90-08-01-00/00 or later

Storage systems with the Use Diskless Quorum option disabled:

- VSP G1000, VSP G1500, and VSP F1500: 80-06-82-00/00-04 or later
- VSP 5100, 5500, 5100H, 5500H: 90-04-06-00/00-05 or later
- VSP 5200, 5600, 5200H, 5600H: 90-08-01-00/00 or later



Note: Multiple runs only support the VSP G1000, VSP G1500, and VSP F1500 as migration source storage systems and VSP G1000, VSP G1500, VSP F1500, VSP 5100, 5500, 5100H, 5500H, and VSP 5200, 5600, 5200H, 5600H as migration target storage systems.

General settings for services

All preconfigured services include the following general settings.

- **Name:** User-defined name for the service. Preconfigured services have default names.
- **Description:** User-defined description for the service. Preconfigured services have default descriptions.
- **Status:** Test or Release. Use Test if the service has not been tested.
- **Tags:** Use tags to classify services and to help organize them.
- **Service Group:** If you are copying or creating a service, you can select a Service Group.
- **Service Template:** Click to view a preview of the Service Template on which the service is based.
- **Advanced Options:** Click to choose scheduling options.

Allocate volumes service templates

The following Ops Center Automator Allocate Volumes service templates for allocating volumes are provided with the software and are preconfigured.

Allocate Fabric Aware Volumes with Configuration Manager

Allocates by using sets of volumes from the associated infrastructure group through Ops Center API Configuration Manager for use by servers running a generic application. This service accesses the FC switch management service and acquires

existing fabric configuration and zoning information when allocating new volumes to the host.

Allocate Volumes with Smart Provisioning

Intelligently allocates by using sets of volumes from the associated infrastructure group through Ops Center API Configuration Manager for use by servers running a generic application.

Allocate Volumes with Clone/Snapshot

Allocates sets of volumes with in-system replication (Thin Image, ShadowImage) from the associated infrastructure group through Ops Center API Configuration Manager to be consumed by servers running a generic application.

Allocate Volumes with 2DC Remote Replication

Intelligently allocates by using sets of volumes from the associated infrastructure group for use by servers running a generic application and creates a new copy topology for remote replication.

Allocate Volumes with Remote Replication (Global-Active Device)

Allocates sets of volumes with in-system replication (global-active device) from the associated infrastructure group through Ops Center API Configuration Manager to be consumed by servers running a generic application.

Supported platforms

For information on supported platforms, see [Service template supported platforms \(on page 146\)](#).

Default ports

Port number	Use
443*	Secure communication from Ops Center Automator to Ops Center Administrator.
22015	Communication from Ops Center Automator client to Ops Center Automator server. Communication from Ops Center Automator to Ops Center Analyzer.*
22016	Secure communication from Ops Center Automator client to Ops Center Automator server. Secure communication from Ops Center Automator to Ops Center Analyzer.*
23450	Communication from Ops Center Automator to Ops Center API Configuration Manager.
23451	Secure communication from Ops Center Automator to Ops Center API Configuration Manager.

Port number	Use
* Allocate Volumes with Smart Provisioning	

Allocate Fabric Aware Volumes with Configuration Manager: Service details

This server enables allocation of sets of volumes from the associated infrastructure group through Configuration Manager for use by servers running a generic application. This service accesses the FC switch management service and acquires existing fabric configuration and zoning information when allocating new volumes to the host.

The following service template details apply to the Allocate Fabric Aware Volumes with Configuration Manager service template.

Software and setup prerequisites

For software and setup prerequisites, see [Service template prerequisites \(on page 126\)](#).

Edit Service settings

The following table lists the Edit Service settings for the Allocate Fabric Aware Volumes with Configuration Manager service template.

Navigation pane	Settings pane	Description
Volume Settings ¹	Configuration Manager Connection	Gives a table from which you can choose the Configuration Manager connection.
	Storage System	Gives a table from which you can choose the storage system.
	Resource Group	Specify a resource group.
	Pool	Gives a table from which you can choose the pool.
	Capacity Format	Specify the volume capacity format as Block or Byte.
	Volume Settings	Specify the parameters to create new volumes.
	Select Capacity Saving Function	Specify the Capacity Saving Function for the target volumes. Refer to your storage system product documentation for the optimal setting.

Navigation pane	Settings pane	Description
	Select Capacity Saving Mode	Specify the Capacity Saving Mode for the target volumes. Refer to your storage system product documentation for the optimal setting.
Resource Criteria ²	Resource Criteria	Specify the Storage Port Configuration Expressions (Name and Value) that meets the specified criteria (Equals, Not Equals, Starts with, and Ends with) based on the selected condition (All or Any).
Host Settings	Port Type	Specify Fibre as the port type.
	Host Group Settings	Specify the parameters required to create a new Host Group or specify to use an existing Host Group.
Fabric Settings	Use Fabric Settings	Select this option to enable fabric information collection.
	Target Fabrics	Specify the fabric name. Separate multiple values by commas. If omitted, all fabrics defined as FOS_PrimarySwitch or DCNM in Connections will be used.
	Fabric Connection Type	Specify the fabric type, either FOS_PrimarySwitch or DCNM to filter the Category in Connections.
	Connections	Specify the connection defined in the Web Service Connections on the Administration tab. If this value is omitted, the system uses all connections that are defined for the product name listed in the Web Service Connections.

Navigation pane	Settings pane	Description
	Use Existing Zone	Specifies whether to select a predefined zone or any connectable path. If you select this option, the system selects paths within the range of the existing active Zone setting. If you do not select this option, the system selects connectable paths regardless of the existing Zone setting.
	Number of Hops Restriction	Determines whether restrict path selection to within an assigned number of hops. When this property enabled, the service will fail if there is no path that matched the specified collection range.
	Maximum Number of Hops	When using the Number of Hops Restriction option, specify the collection range by the number of hops.
Zone Settings	Update Zone Configurations	Determines whether to add to an existing zone or create a new zone. If Use Existing Zone is true, this setting is ignored even if entered.
	Use Existing Zone Aliases	Determines whether to use existing zone aliases. Specify True to use predefined zone aliases regardless of the specified naming conventions. If you specify False, the system selects zone aliases that follow the naming conventions. In either case, if there are no existing zone aliases, the system creates new ones that follow the naming conventions. When selecting the existing Zone Alias, Zone naming is fixed as <i>HostZoneAliasName_StorageZoneAliasName</i> .

Navigation pane	Settings pane	Description
		<p>Note: If the service finds more than one alias candidate which have the same WWN, the alias is chosen based on the following priorities:</p> <ol style="list-style-type: none"> 1. Search existing aliases which only have that WWN. If more than one alias is found, the system selects the first alias in the list of existing aliases. 2. If no alias is found using the first priority, search existing aliases which have multiple WWNs including that WWN. If more than one alias is found, the system selects the first alias in the list of existing aliases.
	Update Current Active Zone Configuration	Determines whether to use Zone Active configuration when adding or creating a zone.
	Zone Configurations to Update	<p>Lists the zone configuration names to add (separated by commas). If Update Zone Configuration is false, this setting is ignored.</p> <p>Note: An error is generated if this setting is not specified and Update Current Active Zone Configuration is false.</p>
	Script for Zone Naming	Specify the naming convention script that determines the Zone name for the path.
	Script for Host Zone Alias Naming	Specify the naming convention script that determines the Zone Alias name for the host port.
	Script for Storage Zone Alias Naming	Specify the naming convention script that determines the Zone Alias name for the storage port.
<p>1. The property settings in v8.6.3 or earlier (Number of Volumes, LDEV ID Starts From, Volume Capacity, Volume Label, LUN Starts from, Virtual LDEV ID Starts From) are not carried forward.</p>		

Navigation pane	Settings pane	Description
2. The property settings in v8.6.3 or earlier are not carried forward.		

Submit Service Request settings

The following table lists the Submit Service Request settings for the Allocate Fabric Aware Volumes with Configuration Manager service template.

Navigation pane	Settings pane	Description
Volume Settings ¹	Configuration Manager Connection	Gives a table from which you can choose the Configuration Manager connection.
	Storage System	Gives a table from which you can choose the storage system.
	Resource Group	Specify a resource group.
	Pool	Gives a table from which you can choose the pool.
	Capacity Format	Specify the volume capacity format as Block or Byte.
	Volume Settings	Specify the parameters to create new volumes.
	Select Capacity Saving Function	Specify the Capacity Saving Function for the target volumes. Refer to your storage system product documentation for the optimal setting.
	Select Capacity Saving Mode	Specify the Capacity Saving Mode for the target volumes. Refer to your storage system product documentation for the optimal setting.
Resource Criteria ²	Resource Criteria	Specify the Storage Port Configuration Expressions (Name and Value) that meets the specified criteria (Equals, Not Equals, Starts with, and Ends with) based on the selected condition (All or Any).
Host Settings	Port Type	Specify Fibre as the port type.

Navigation pane	Settings pane	Description
	Host Group Settings	Specify the parameters required to create a new Host Group or specify to use an existing Host Group.
Fabric Settings	Use Fabric Settings	Select this option to enable fabric information collection.
	Target Fabrics	Specify the fabric name. Separate multiple values by commas. If omitted, all fabrics defined as FOS_PrimarySwitch or DCNM in Connections will be used.
	Fabric Connection Type	Specify the fabric type, either FOS_PrimarySwitch or DCNM to filter the Category in Connections.
	Connections	Specify the connection defined in the Web Service Connections on the Administration tab. If this value is omitted, the system uses all connections that are defined for the product name listed in the Web Service Connections.
	Use Existing Zone	Specifies whether to select a predefined zone or any connectable path. If you select this option, the system selects paths within the range of the existing active Zone setting. If you do not select this option, the system selects connectable paths regardless of the existing Zone setting.
	Number of Hops Restriction	Determines whether restrict path selection to within an assigned number of hops. When this property enabled, the service will fail if there is no path that matched the specified collection range.
	Maximum Number of Hops	When using the Number of Hops Restriction option, specify the collection range by the number of hops.

Navigation pane	Settings pane	Description
Zone Settings	Update Zone Configurations	Determines whether to add to an existing zone or create a new zone. If Use Existing Zone is true, this setting is ignored even if entered.
	Use Existing Zone Aliases	<p>Determines whether to use existing zone aliases. Specify True to use predefined zone aliases regardless of the specified naming conventions. If you specify False, the system selects zone aliases that follow the naming conventions. In either case, if there are no existing zone aliases, the system creates new ones that follow the naming conventions. When selecting the existing Zone Alias, Zone naming is fixed as <i>HostZoneAliasName_StorageZoneAliasName</i>.</p> <p>Note: If the service finds more than one alias candidate which have the same WWN, the alias is chosen based on the following priorities:</p> <ol style="list-style-type: none"> 1. Search existing aliases which only have that WWN. If more than one alias is found, the system selects the first alias in the list of existing aliases. 2. If no alias is found using the first priority, search existing aliases which have multiple WWNs including that WWN. If more than one alias is found, the system selects the first alias in the list of existing aliases.
	Update Current Active Zone Configuration	Determines whether to use Zone Active configuration when adding or creating a zone.

Navigation pane	Settings pane	Description
	Zone Configurations to Update	Lists the zone configuration names to add (separated by commas). If Update Zone Configuration is false, this setting is ignored. Note: An error is generated if this setting is not specified and Update Current Active Zone Configuration is false.
	Script for Zone Naming	Specify the naming convention script that determines the Zone name for the path.
	Script for Host Zone Alias Naming	Specify the naming convention script that determines the Zone Alias name for the host port.
	Script for Storage Zone Alias Naming	Specify the naming convention script that determines the Zone Alias name for the storage port.
<ol style="list-style-type: none"> 1. The property settings in v8.6.3 or earlier (Number of Volumes, LDEV ID Starts From, Volume Capacity, Volume Label, LUN Starts from, Virtual LDEV ID Starts From) are not carried forward. 2. The property settings in v8.6.3 or earlier are not carried forward. 		

Zone naming conventions

The following table lists the zone naming conventions for use with the Allocate Fabric Aware Volumes with Configuration Manager service template.

Type	Zone name	Zone alias name (Host side/Storage side)
Input	One object has the following properties: <ul style="list-style-type: none"> ▪ hostName: Host name ▪ hostPortWorldWideName: WWN of HBA. Separator notation is based on FC switch manager services. ▪ storagePortWorldWideName: WWN of CHA. Separator notation is based on FC switch manager services. ▪ storageSystemSerialNumber: Serial number of physical storage system 	

Type	Zone name	Zone alias name (Host side/Storage side)
	<ul style="list-style-type: none"> storagePortName: Display port name of the storage system serviceProperties: List of the service properties passed to the plug-in 	
Output	Zone name to add to the specified Zone Configuration.	Zone alias name to add to the zone specified in the Zone name convention.
Handling when the output is the same name	<p>Same zone name of the same fabric refers to the same zone.</p> <p>In the case of an existing zone: Add an alias in the zone and add to the Zone Configuration.</p> <p>null: Do not create a zone.</p>	<p>Same zone alias name of the same fabric refers to the same alias.</p> <p>In the case of an existing alias: Add WWN in the alias and add to the Zone.</p> <p>null: Do not create an alias.</p>
Handling when unavailable characters are used for output	Characters other than alphanumeric characters and "_" are converted to "_" and become part of the name.	
If the output string is too long	When the output string is over 60 characters, the 61st and subsequent characters are truncated.	When the output string is over 64 characters or more, the 65th and subsequent characters are truncated.
Validation	<p>An error occurs if the return value is one of following:</p> <ul style="list-style-type: none"> Other than String When starting from non-alphabetic characters. When having a non-standard prefix for the zone. ("LSAN_", "TL_", "QOS[HML] [0-9]+_")(case ignored) 	<p>An error occurs if the return value is one of following:</p> <ul style="list-style-type: none"> Other than String When starting from non-alphabetic characters.

Allocate Volumes with Smart Provisioning: Service details

The following service template details apply to the Allocate Volumes with Smart Provisioning service template.

When using this service template, be aware that you cannot specify "SSD(QLC)" for "Disk Type" in the Edit/Submit Service window. If you do not specify any "Disk Type" value, pools with all the disk type including SSD(QLC) become candidate pools. If you want to use an SSD(QLC) drive, identify a pool with SSD(QLC) by another tool (such as VSP One Block Administrator) and specify the pool for "Pool" in the Edit/Submit Service window.

You can watch a [video](#) on how to use this service template.

Software and setup prerequisites

For software and setup prerequisites, see [Service template prerequisites \(on page 126\)](#).

Edit Service settings

The following table lists the Edit Service settings for the Allocate Volumes with Smart Provisioning service template.

Navigation pane	Settings pane	Description
Volume Settings	Configuration Manager Connection	Shows a table from which you can choose the Configuration Manager connection.
	Storage System Selection	Specify whether to select storage system at volume allocation. If you select Automatic, then a storage system will be selected automatically.
	Select from	Specify where to select from in the automatic selection: <ul style="list-style-type: none"> "All Storage Systems" selects from all storage systems registered on Configuration Manager. "Virtual Storage Machine" selects the storage system to provision from the storage systems that comprise the specified virtual storage machine.
	Virtual Storage Mapping Definition	
	Virtual Model	Specify the virtual model of the Virtual Storage Machine by referring to the Virtual Storage Machine table.

Navigation pane	Settings pane	Description
	Virtual Serial Number	Specify the virtual serial number of the Virtual Storage Machine by referring to the Virtual Storage Machine table.
	Physical Storage System	
	Model	Specify the model of the storage system registered on Configuration Manager.
	Serial Number	Specify the serial number of the storage system registered on Configuration Manager.
	Virtual LDEV ID Range	
	Starts from	Specify the start of the Virtual LDEV ID range for the volume to allocate.
	Ends at	Specify the end of the Virtual LDEV ID range for the volume to allocate.
	Virtual Storage Machine	<p>Specify the Virtual Storage Machine. If the "Virtual Storage Machine consists of one Resource Group" column is "No", then the resource group with the minimum ID will be used. If the "Virtual Storage Mapping Definition" column is "None" or "Unnecessary", then revise Virtual Storage Mapping.</p> <p>"Virtual Storage Machine consists of one Resource Group" column values:</p> <ul style="list-style-type: none"> ▪ Yes: There is no storage system with multiple resource groups. ▪ No: There is one or more storage systems with multiple resource groups.

Navigation pane	Settings pane	Description
		<p>"Virtual Storage Mapping Definition" column values:</p> <ul style="list-style-type: none"> None: There is no VSM or registered storage system definition in the Virtual Storage Mapping Definition. Unnecessary: There is an unregistered storage system in the Virtual Storage Mapping Definition. OK: Other than above.
	Select MPU/MPB based on utilization	Select "Disabled" to automatically assign each MPU/MPB so that the number of volumes to be processed is divided equally among the MPUs/MPBs whose auto assignment setting is set to "Enabled" after the storage system is determined. Select "Enabled" to acquire the average MPU utilization from Clear Sight, select a storage system based on the utilization, and assign the MPU/MPB with the lowest utilization out of all MPUs/MPBs in the storage system to the volumes.
	Monitoring Connection	Select a performance monitor.
	Performance evaluation window	Evaluate MPU/MPB utilization based on the specified performance history window in days.
	Storage System	Specify the storage system.
	Resource Group Selection	Specify whether to select resource group at volume allocation. If you select Meta resource, then the meta resource group will be selected.
	Resource Group	Specify the resource group.

Navigation pane	Settings pane	Description
	Pool Selection *	Specify whether to select pool at volume allocation. If you select Automatic, then a pool will be selected automatically.
	Pool	Specify the pool.
	Capacity Format	Specify the volume capacity format as Block or Byte.
	Volume Settings	Specify the parameters for creating new volumes.
	Volume Settings	
	Volume Usage	Specify the volume usage to be assigned.
	Number of Volumes	Specify the number of volumes.
	Volume Capacity	When Byte is selected for Capacity Format, specify the volume capacity in bytes. When Block is selected for Capacity Format, the volume capacity is specified by the number of blocks.
	Volume Label	Specify the volume label.
	Disk Type	Specify the disk type to be used to configure the pool. This setting is ignored when specifying a pool or reusing a pool allocated to a host. You cannot specify "SSD(QLC)".
	LDEV Setting	
	LDEV ID Starts From	Specify the startup LDEV ID as a hexadecimal number for the volume to allocate.
	Virtual LDEV ID Starts From	Specify the startup Virtual LDEV ID for the volume to allocate.
	LUN Setting	
	LUN Starts From	Specify the starting logical unit number assigned to the volume for a host.

Navigation pane	Settings pane	Description
	Select Capacity Saving Function	Specify the Capacity Saving Function for the target volumes. Refer to your storage system product documentation for the optimal setting.
	Select Capacity Saving Mode	Specify the Capacity Saving Mode for the target volumes. Refer to your storage system product documentation for the optimal setting.
Resource Criteria	Resource Criteria	Specify the Storage Port Configuration Expressions (Name and Value) that meets the specified criteria (Equals, Not Equals, Starts with, and Ends with) based on the selected condition (All or Any).
	Choose pool/port based on	Select the pool or port based on its capacity, or its capacity and performance history. The performance history consists of BusyRate in the case of pools, and Port Transfer rate in the case of ports.
	Monitoring Connection	Select a performance monitor.
	Pool BusyRate lower than	Choose a pool with BusyRate percentage lower than the specified value.
	Port Transfer Rate lower than	Choose a port with TransferRate in MBps lower than the specified value.
	Performance evaluation window	Evaluate Pool BusyRate and Port TransferRate based on the specified performance history window in days.
Host Settings	Input Type	Specify the host input type as Input Host information to add a new host or specify Select Host to use an existing host.

Navigation pane	Settings pane	Description
	Port Type	Specify the port type as Fibre or iSCSI.
	Host Mode/Host Mode Options	Specify the parameters for creating a new host group.
	Host Mode	Specify the host mode.
	Host Mode Options	Specify the host mode options.
	Number of Hosts	Select the number of hosts to allocate volume.
	Host Settings	Specify information about the hosts where the volumes will be allocated.
	Host Name	Specify the host name.
	WWN Settings	Specify WWN settings.
	WWN	Specify the World Wide Name (WWN).
	WWN Nickname	Specify the WWN nickname.
	Multiple Hosts Per Storage Port	Select to share storage ports with multiple hosts.
	Multiple Hosts Per Host Group	Select to share host groups with multiple hosts.
	Host Settings	Specify information about the hosts where the volumes will be allocated.
	Host Name	Specify the host name.
	WWN Settings	Specify WWN settings.
	WWN	Specify the World Wide Name (WWN).
	WWN Nickname	Specify the WWN nickname.
	iSCSI Settings	Specify the iSCSI settings when using the iSCSI port type.
	iSCSI Name	Specify the iSCSI name.
	iSCSI Nickname	Specify the iSCSI nickname.

Navigation pane	Settings pane	Description
	Storage Management Connection	Specify the host input type as Input Host information to add a new host or specify Select Host to use an existing host.
	Hosts Filter	Use the filters to display only the source hosts that match the specified criteria.
	Rows Per Page	Use the filter to display only the specified number of source hosts.
	Current Page	Use the filter to display only the specified page number of the rows per page number of source hosts.
	Hosts	Select the hosts which allocate volumes.
	Join Host Filters By	Use the "and" or the "or" operator to join multiple filters.
	Select the same storage system	Specify whether to select the same storage system and pool as existing volumes if any volumes have already been allocated to the specified host/WWN/iSCSI name. If "Enabled" is specified, volumes will be created on the same storage system and pool as the existing volumes. If "Disabled" is specified, volumes will be created on a pool with the lowest usage rate.
Fabric Settings	Use Fabric Settings	Select this option to enable fabric information collection.
	Target Fabrics	Specify the fabric name. Separate multiple values by commas. If omitted, all fabrics defined as FOS_PrimarySwitch or DCNM in Connections will be used.
	Fabric Connection Type	Specify the fabric type, either FOS_PrimarySwitch or DCNM to filter the Category in Connections.

Navigation pane	Settings pane	Description
	Connections	Specify the connection defined in the Web Service Connections on the Administration tab. If this value is omitted, the system uses all connections that are defined for the product name listed in the Web Service Connections.
	Use Existing Zone	Specifies whether to select a predefined zone or any connectable path. If you select this option, the system selects paths within the range of the existing active Zone setting. If you do not select this option, the system selects connectable paths regardless of the existing Zone setting.
	Number of Hops Restriction	Determines whether restrict path selection to within an assigned number of hops. When this property enabled, the service will fail if there is no path that matched the specified collection range.
	Maximum Number of Hops	When using the Number of Hops Restriction option, specify the collection range by the number of hops.
Zone Settings	Update Zone Configurations	Select this option to enable the modification of zone settings.
	Use Existing Zone Aliases	Select this option to use predefined Zone Aliases regardless of the naming conventions the user specifies. If you do not select this option, the system selects Zone Aliases that follow the naming conventions. In either case, if there are no existing Zone Aliases, the system creates new Zone Aliases that follow the naming conventions.
	Update Current Active Zone Configuration	Select this option to add a Zone to the active Zone Configuration.

Navigation pane	Settings pane	Description
	Zone Configurations to Update	To add a zone to a Zone Configuration other than the active configuration, specify the name of the Zone Configuration in which to add the zone.
	Script for Zone Naming	Specify the naming convention script that determines the Zone name for the path.
	Script for Host Zone Alias Naming	Specify the naming convention script that determines the Zone Alias name for the host port.
	Script for Storage Zone Alias Naming	Specify the naming convention script that determines the Zone Alias name for the storage port.
<p>Notes:</p> <p>* If you select Automatic for Pool Selection in the Volume Settings panel of the Edit/Submit Service window, the pool is automatically selected using the following criteria:</p> <ol style="list-style-type: none"> 1. Select the pool with the largest free pool capacity after volume allocation. 2. If the free pool capacity is the same, select the pool on the storage system with the higher priority in the following table. 3. If no storage port is found where an LU path with the selected storage system and pool combination can be created, go back to 1 and select the next candidate pool. 		

Navigation pane	Settings pane	Description
Priority	Storage model	
1	VSP 5200, 5600, 5200H, 5600H	
2	VSP 5100, 5500, 5100H, 5500H	
3	VSP F1500, VSP G1500, VSP G1000	
4	VSP One B28	
5	VSP One B26	
6	VSP One B24	
7	VSP E1090, VSP E1090H	
8	VSP E990	
9	VSP E790, VSP E790H	
10	VSP E590, VSP E590H	
11	VSP F900, VSP G900	
12	VSP F700, VSP G700	
13	VSP F370, VSP G370	
14	VSP F350, VSP G350	
15	VSP F800, VSP G800, VSP N800	
16	VSP F400, VSP F600, VSP G400, VSP G600, VSP N400, VSP N600	
17	VSP G200	

Submit Service Request settings

The following table lists the Submit Service Request settings for the Allocate Volumes with Smart Provisioning service template.

Navigation pane	Settings pane	Description
Volume Settings	Configuration Manager Connection	Shows a table from which you can choose the Configuration Manager connection.

Navigation pane	Settings pane	Description
	Storage System Selection	Specify whether to select storage system at volume allocation. If you select Automatic, then a storage system will be selected automatically.
	Select from	Specify where to select from in the automatic selection: <ul style="list-style-type: none"> ▪ "All Storage Systems" selects from all storage systems registered on Configuration Manager. ▪ "Virtual Storage Machine" selects the storage system to provision from the storage systems that comprise the specified virtual storage machine.
	Virtual Storage Machine	Specify the Virtual Storage Machine. If the "Virtual Storage Machine consists of one Resource Group" column is "No", then the resource group with the minimum ID will be used. If the "Virtual Storage Mapping Definition" column is "None" or "Unnecessary", then revise Virtual Storage Mapping. "Virtual Storage Machine consists of one Resource Group" column values: <ul style="list-style-type: none"> ▪ Yes: There is no storage system with multiple resource groups. ▪ No: There is one or more storage systems with multiple resource groups.

Navigation pane	Settings pane	Description
		<p>"Virtual Storage Mapping Definition" column values:</p> <ul style="list-style-type: none"> None: There is no VSM or registered storage system definition in the Virtual Storage Mapping Definition. Unnecessary: There is an unregistered storage system in the Virtual Storage Mapping Definition. OK: Other than above.
	Select MPU/MPB based on utilization	Select "Disabled" to automatically assign each MPU/MPB so that the number of volumes to be processed is divided equally among the MPUs/MPBs whose auto assignment setting is set to "Enabled" after the storage system is determined. Select "Enabled" to acquire the average MPU utilization from Clear Sight, select a storage system based on the utilization, and assign the MPU/MPB with the lowest utilization out of all MPUs/MPBs in the storage system to the volumes.
	Monitoring Connection	Select a performance monitor.
	Performance evaluation window	Evaluate MPU/MPB utilization based on the specified performance history window in days.
	Storage System	Specify the storage system.
	Resource Group Selection	Specify whether to select resource group at volume allocation. If you select Meta resource, then the meta resource group will be selected.
	Resource Group	Specify the resource group.

Navigation pane	Settings pane	Description
	Pool Selection *	Specify whether to select pool at volume allocation. If you select Automatic, then a pool will be selected automatically.
	Pool	Specify the pool.
	Capacity Format	Specify the volume capacity format as Block or Byte.
	Volume Settings	Specify the parameters for creating new volumes.
	Volume Settings	
	Volume Usage	Specify the volume usage to be assigned.
	Number of Volumes	Specify the number of volumes.
	Volume Capacity	When Byte is selected for Capacity Format, specify the volume capacity in bytes. When Block is selected for Capacity Format, the volume capacity is specified by the number of blocks.
	Volume Label	Specify the volume label.
	Disk Type	Specify the disk type to be used to configure the pool. This setting is ignored when specifying a pool or reusing a pool allocated to a host. You cannot specify "SSD(QLC)".
	LDEV Setting	
	LDEV ID Starts From	Specify the startup LDEV ID as a hexadecimal number for the volume to allocate.
	Virtual LDEV ID Starts From	Specify the startup Virtual LDEV ID for the volume to allocate.
	LUN Setting	
	LUN Starts From	Specify the starting logical unit number assigned to the volume for a host.

Navigation pane	Settings pane	Description
	Select Capacity Saving Function	Specify the Capacity Saving Function for the target volumes. Refer to your storage system product documentation for the optimal setting.
	Select Capacity Saving Mode	Specify the Capacity Saving Mode for the target volumes. Refer to your storage system product documentation for the optimal setting.
Resource Criteria	Resource Criteria	Specify the Storage Port Configuration Expressions (Name and Value) that meets the specified criteria (Equals, Not Equals, Starts with, and Ends with) based on the selected condition (All or Any).
	Choose pool/port based on	Select the pool or port based on its capacity, or its capacity and performance history. The performance history consists of BusyRate in the case of pools, and Port Transfer rate in the case of ports.
	Monitoring Connection	Select a performance monitor.
	Pool BusyRate lower than	Choose a pool with BusyRate percentage lower than the specified value.
	Port Transfer Rate lower than	Choose a port with TransferRate in MBps lower than the specified value.
	Performance evaluation window	Evaluate Pool BusyRate and Port TransferRate based on the specified performance history window in days.
Host Settings	Input Type	Specify the host input type as Input Host information to add a new host or specify Select Host to use an existing host.

Navigation pane	Settings pane	Description
	Port Type	Specify the port type as Fibre or iSCSI.
	Host Mode/Host Mode Options	Specify the parameters for creating a new host group.
	Host Mode	Specify the host mode.
	Host Mode Options	Specify the host mode options.
	Number of Hosts	Select the number of hosts to allocate volume.
	Host Settings	Specify information about the hosts where the volumes will be allocated.
	Host Name	Specify the host name.
	WWN Settings	Specify WWN settings.
	WWN	Specify the World Wide Name (WWN).
	WWN Nickname	Specify the WWN nickname.
	Multiple Hosts Per Storage Port	Select to share storage ports with multiple hosts.
	Multiple Hosts Per Host Group	Select to share host groups with multiple hosts.
	Host Settings	Specify information about the hosts where the volumes will be allocated.
	Host Name	Specify the host name.
	WWN Settings	Specify WWN settings.
	WWN	Specify the World Wide Name (WWN).
	WWN Nickname	Specify the WWN nickname.
	iSCSI Settings	Specify the iSCSI settings when using the iSCSI port type.
	iSCSI Name	Specify the iSCSI name.
	iSCSI Nickname	Specify the iSCSI nickname.

Navigation pane	Settings pane	Description
	Storage Management Connection	Specify the host input type as Input Host information to add a new host or specify Select Host to use an existing host.
	Hosts Filter	Use the filters to display only the source hosts that match the specified criteria.
	Rows Per Page	Use the filter to display only the specified number of source hosts.
	Current Page	Use the filter to display only the specified page number of the rows per page number of source hosts.
	Hosts	Select the hosts which allocate volumes.
	Join Host Filters By	Use the "and" or the "or" operator to join multiple filters.
	Select the same storage system	Specify whether to select the same storage system and pool as existing volumes if any volumes have already been allocated to the specified host/WWN/iSCSI name. If "Enabled" is specified, volumes will be created on the same storage system and pool as the existing volumes. If "Disabled" is specified, volumes will be created on a pool with the lowest usage rate.
Fabric Settings	Use Fabric Settings	Select this option to enable fabric information collection.
	Target Fabrics	Specify the fabric name. Separate multiple values by commas. If omitted, all fabrics defined as FOS_PrimarySwitch or DCNM in Connections will be used.
	Fabric Connection Type	Specify the fabric type, either FOS_PrimarySwitch or DCNM to filter the Category in Connections.

Navigation pane	Settings pane	Description
	Connections	Specify the connection defined in the Web Service Connections on the Administration tab. If this value is omitted, the system uses all connections that are defined for the product name listed in the Web Service Connections.
	Use Existing Zone	Specifies whether to select a predefined zone or any connectable path. If you select this option, the system selects paths within the range of the existing active Zone setting. If you do not select this option, the system selects connectable paths regardless of the existing Zone setting.
	Number of Hops Restriction	Determines whether restrict path selection to within an assigned number of hops. When this property enabled, the service will fail if there is no path that matched the specified collection range.
	Maximum Number of Hops	When using the Number of Hops Restriction option, specify the collection range by the number of hops.
Zone Settings	Update Zone Configurations	Select this option to enable the modification of zone settings.
	Use Existing Zone Aliases	Select this option to use predefined Zone Aliases regardless of the naming conventions the user specifies. If you do not select this option, the system selects Zone Aliases that follow the naming conventions. In either case, if there are no existing Zone Aliases, the system creates new Zone Aliases that follow the naming conventions.
	Update Current Active Zone Configuration	Select this option to add a Zone to the active Zone Configuration.

Navigation pane	Settings pane	Description
	Zone Configurations to Update	To add a zone to a Zone Configuration other than the active configuration, specify the name of the Zone Configuration in which to add the zone.
	Script for Zone Naming	Specify the naming convention script that determines the Zone name for the path.
	Script for Host Zone Alias Naming	Specify the naming convention script that determines the Zone Alias name for the host port.
	Script for Storage Zone Alias Naming	Specify the naming convention script that determines the Zone Alias name for the storage port.
<p>Notes:</p> <p>* If you select Automatic for Pool Selection in the Volume Settings panel of the Edit/Submit Service window, the pool is automatically selected using the following criteria:</p> <ol style="list-style-type: none"> 1. Select the pool with the largest free pool capacity after volume allocation. 2. If the free pool capacity is the same, select the pool on the storage system with the higher priority in the following table. 3. If no storage port is found where an LU path with the selected storage system and pool combination can be created, go back to 1 and select the next candidate pool. 		

Navigation pane	Settings pane	Description
Priority	Storage model	
1	VSP 5200, 5600, 5200H, 5600H	
2	VSP 5100, 5500, 5100H, 5500H	
3	VSP F1500, VSP G1500, VSP G1000	
4	VSP One B28	
5	VSP One B26	
6	VSP One B24	
7	VSP E1090, VSP E1090H	
8	VSP E990	
9	VSP E790, VSP E790H	
10	VSP E590, VSP E590H	
11	VSP F900, VSP G900	
12	VSP F700, VSP G700	
13	VSP F370, VSP G370	
14	VSP F350, VSP G350	
15	VSP F800, VSP G800, VSP N800	
16	VSP F400, VSP F600, VSP G400, VSP G600, VSP N400, VSP N600	
17	VSP G200	

Zone naming conventions

The following table lists the zone naming conventions for use with the Allocate Volumes with Smart Provisioning service template.

Type	Zone name	Zone alias name (Host side/Storage side)
Input	<p>One object has the following properties:</p> <ul style="list-style-type: none"> hostName: Host name hostPortWorldWideName: WWN of HBA. Separator notation is based on FC switch manager services. storagePortWorldWideName: WWN of CHA. Separator notation is based on FC switch manager services. storageSystemSerialNumber: Serial number of physical storage system storagePortName: Display port name of the storage system serviceProperties: List of the service properties passed to the plug-in 	
Output	Zone name to add to the specified Zone Configuration.	Zone alias name to add to the zone specified in the Zone name convention.
Handling when the output is the same name	<p>Same zone name of the same fabric refers to the same zone.</p> <p>In the case of an existing zone: Add an alias in the zone and add to the Zone Configuration.</p> <p>null: Do not create a zone.</p>	<p>Same zone alias name of the same fabric refers to the same alias.</p> <p>In the case of an existing alias: Add WWN in the alias and add to the Zone.</p> <p>null: Do not create an alias.</p>
Handling when unavailable characters are used for output	Characters other than alphanumeric characters and "_" are converted to "_" and become part of the name.	
If the output string is too long	When the output string is over 60 characters, the 61st and subsequent characters are truncated.	When the output string is over 64 characters or more, the 65th and subsequent characters are truncated.

Type	Zone name	Zone alias name (Host side/Storage side)
Validation	<p>An error occurs if the return value is one of following:</p> <ul style="list-style-type: none"> Other than String When starting from non-alphabetic characters. When having a non-standard prefix for the zone. ("LSAN_", "TI_", "QOS[HML] [0-9]+_")(case ignored) 	<p>An error occurs if the return value is one of following:</p> <ul style="list-style-type: none"> Other than String When starting from non-alphabetic characters.

Allocate Volumes with Clone/Snapshot: Service details

The following service template details apply to the Allocate Volumes with Clone/Snapshot service template:

Software and setup prerequisites

For software and setup prerequisites, see [Service template prerequisites \(on page 126\)](#).

Edit Service settings

The following table lists the Edit Service settings for the Allocate Volumes with Clone/Snapshot service templates.

Navigation pane	Settings pane	Description
Volume Settings	Configuration Manager Connection	Specify the Configuration Manager Connection.
	Storage System	Specify the Storage System.
	Resource Group	Specify the Resource Group.
	Target Volumes	Specify whether to use existing volumes or create new ones.
	Capacity Format	Specify the volume capacity format as Byte or Block.
	Volume Settings	Specify the parameters required to create new volumes.
	Volume Usage	Specify the volume usage.

Navigation pane	Settings pane	Description
	Number of Volumes	Specify the number of volumes.
	LDEV ID Starts from	Specify the startup LDEV ID as a hexadecimal number for the volume to allocate.
	Volume Capacity	Specify the volume capacity.
	Volume Label	Specify the volume label.
	LUN Starts from	Specify the starting logical unit number assigned to the volume for a host.
	Virtual LDEV ID Starts From	Specify the startup Virtual LDEV ID for the volume to allocate.
	Pool	Specify the pool.
	Select Capacity Saving Function	Specify the Capacity Saving Function for the target volumes. Refer to your storage system product documentation for the optimal setting.
	Volume Filter	Specify conditions for filtering the candidate volumes. Not all candidates are displayed when there are many candidate volumes. Specify the conditions to narrow down the volume list.
	Volume Filter Join Type	Specify the source volume filter join type.
	Volumes	Specify the volume to be used as the primary volume.
	Select Capacity Saving Mode	Specify the Capacity Saving Mode for the target volumes. Refer to your storage system product documentation for the optimal setting.

Navigation pane	Settings pane	Description
Resource Criteria	Resource Criteria	Specify the Storage Port Configuration Expressions (Name and Value) that meets the specified criteria (Equals, Not Equals, Starts with, and Ends with) based on the selected condition (All or Any).
Host Settings	Port Type	Specify the port type as Fibre or iSCSI.
	Host Group Settings	Specify the parameters required to create a new Host Group/iSCSI Target or specify an existing Host Group/iSCSI Target.
Fabric Settings	Use Fabric Settings	Specify True to enable fabric information collection.
	Connection Names	Specify the connection name defined in the Web Service Connections on the Administration tab. Separate multiple values by commas. If this value is omitted, the system uses all defined connections for the product name listed in the Web Service Connections.
	Resource Groups	Specify the switch management server resource group. Separate multiple values by commas.
	Target Fabrics	Specify the fabric name. Separate multiple values by commas. If this value is omitted, the system uses all the fabrics that the BNA monitors.

Navigation pane	Settings pane	Description
	Use Existing Zone	Specifies whether to select a predefined zone or any connectable path. If you specify True, the system selects paths within the range of the existing Zone setting. If you specify False, the system selects connectable paths regardless of the existing Zone setting.
	Number of Hops Restriction	Determines whether restrict path selection to within an assigned number of hops. When this property enabled, the service will fail if there is no path that matched the specified collection range.
	Maximum Number of Hops	When using the Number of Hops Restriction option, specify the collection range by the number of hops.
Zone Settings	Update Zone Configurations	Specify True to enable zone setting modification.
	Use Existing Zone Aliases	Specify True to use predefined Zone Aliases regardless of the naming conventions the user specifies. If you specify False, the system selects Zone Aliases that follow the naming conventions. In either case, if there are no existing Zone Aliases, the system creates new Zone Aliases that follow the naming conventions.
	Update Current Active Zone Configuration	Specify True to add a Zone to the active Zone Configuration.

Navigation pane	Settings pane	Description
	Zone Configurations to Update	To add a zone to a Zone Configuration other than the active configuration, specify the name of the Zone Configuration in which to add the zone.
	Script for Zone Naming	Specify the naming convention script that determines the Zone name for the path.
	Script for Host Zone Alias Naming	Specify the naming convention script that determines the Zone Alias name for the host port.
	Script for Storage Zone Alias Naming	Specify the naming convention script that determines the Zone Alias name for the storage port.
Copy Pair Settings	Copy Type	Specify the copy type as Clone or Snapshot.
	Number of Generations	Specify the number of secondary volumes to be created for the primary volume. The number of secondary volumes becomes the number of generations. A copy group is created for each generation as well.
	Prefix of Group Name	Specify the prefix of the copy group name to be assigned when creating the copy group. The copy group name is created by adding the prefix to the serial number of the generation.
	CTG Option	Specify whether to set the consistency group (CTG) option at pair creation. If you specify 'Enabled', a copy pair is created by using the CTG option.

Navigation pane	Settings pane	Description
Secondary Volume Settings Note: When you selected the existing volumes as target volumes, a maximum of 20 Secondary Volume Settings can be specified.	Pool	Specify the pool for S-VOL.
	Secondary Volume Settings	Specify the parameters for the Secondary Volume Settings (S-VOL).
	Volume Usage	Specify the volume usage.
	LDEV ID Starts from	Specify the startup LDEV ID as a hexadecimal number for the volume to allocate.
	Volume Label	Specify the volume label.
	LUN Starts from	Specify the starting logical unit number assigned to the volume for a host.
	Virtual LDEV ID Starts From	Specify the startup Virtual LDEV ID for the volume to allocate.
	Create Secondary Volume	Specify whether to create Secondary Volumes.
	Secondary Volume Type	Specify the volume type as DP-VOL or V-VOL.
	Average Differential Data Size Per Collection	Specify the average differential data size per collection (%).
	Primary Volume LDEV ID	Specify the Primary Volume LDEV ID.
	Select Capacity Saving Function	Specify the Capacity Saving Function for the target volumes. Refer to your storage system product documentation for the optimal setting.
	Select Capacity Saving Mode	Specify the Capacity Saving Mode for the target volumes. Refer to your storage system product documentation for the optimal setting.

Navigation pane	Settings pane	Description
Secondary Volume Resource Criteria	Resource Criteria	Specify the Storage Port Configuration Expressions (Name and Value) that meets the specified criteria (Equals, Not Equals, Starts with, and Ends with) based on the selected condition (All or Any).
Backup Host Settings	Port Type	Specify the port type for S-Vols as Fibre or iSCSI.
	Host Group Settings	Specify the parameters required to create a new Host Group/iSCSI Target or specify an existing Host Group/iSCSI Target for S-Vols.
Fabric Settings for Secondary Volumes	Use Fabric Settings	Specify True to enable fabric information collection.
	Connection Names	Specify the connection name defined in the Web Service Connections on the Administration tab. Separate multiple values by commas. If this value is omitted, the system uses all defined connections for the product name listed in the Web Service Connections.
	Resource Groups	Specify the switch management server resource group. Separate multiple values by commas.
	Target Fabrics	Specify the fabric name. Separate multiple values by commas. If this value is omitted, the system uses all the fabrics that the BNA monitors.

Navigation pane	Settings pane	Description
	Use Existing Zone	Specifies whether to select a predefined zone or any connectable path. If you specify True, the system selects paths within the range of the existing Zone setting. If you specify False, the system selects connectable paths regardless of the existing Zone setting.
	Number of Hops Restriction	Determines whether restrict path selection to within an assigned number of hops. When this property enabled, the service will fail if there is no path that matched the specified collection range.
	Maximum Number of Hops	When using the Number of Hops Restriction option, specify the collection range by the number of hops.
Zone Settings for Secondary Volumes	Update Zone Configurations	Specify True to enable zone setting modification.
	Use Existing Zone Aliases	Specify True to use predefined Zone Aliases regardless of the naming conventions the user specifies. If you specify False, the system selects Zone Aliases that follow the naming conventions. In either case, if there are no existing Zone Aliases, the system creates new Zone Aliases that follow the naming conventions.
	Update Current Active Zone Configuration	Specify True to add a Zone to the active Zone Configuration.

Navigation pane	Settings pane	Description
	Zone Configurations to Update	To add a zone to a Zone Configuration other than the active configuration, specify the name of the Zone Configuration in which to add the zone.
	Script for Zone Naming	Specify the naming convention script that determines the Zone name for the path.
	Script for Host Zone Alias Naming	Specify the naming convention script that determines the Zone Alias name for the host port.
	Script for Storage Zone Alias Naming	Specify the naming convention script that determines the Zone Alias name for the storage port.

Submit Service Request settings

The following table lists the Submit Service Request settings for the Allocate Volumes with Clone/Snapshot service templates.

Navigation pane	Settings pane	Description
Volume Settings	Configuration Manager Connection	Specify the Configuration Manager Connection.
	Storage System	Specify the Storage System.
	Resource Group	Specify the Resource Group.
	Target Volumes	Specify whether to use existing volumes or create new ones.
	Capacity Format	Specify the volume capacity format as Byte or Block.
	Volume Settings	Specify the parameters required to create new volumes.
	Volume Usage	Specify the volume usage.

Navigation pane	Settings pane	Description
	Number of Volumes	Specify the number of volumes.
	LDEV ID Starts from	Specify the startup LDEV ID as a hexadecimal number for the volume to allocate.
	Volume Capacity	Specify the volume capacity.
	Volume Label	Specify the volume label.
	LUN Starts from	Specify the starting logical unit number assigned to the volume for a host.
	Virtual LDEV ID Starts From	Specify the startup Virtual LDEV ID for the volume to allocate.
	Pool	Specify the pool.
	Select Capacity Saving Function	Specify the Capacity Saving Function for the target volumes. Refer to your storage system product documentation for the optimal setting.
	Volume Filter	Specify conditions for filtering the candidate volumes. Not all candidates are displayed when there are many candidate volumes. Specify the conditions to narrow down the volume list.
	Volume Filter Join Type	Specify the source volume filter join type.
	Volumes	Specify the volume to be used as the primary volume.
	Select Capacity Saving Mode	Specify the Capacity Saving Mode for the target volumes. Refer to your storage system product documentation for the optimal setting.

Navigation pane	Settings pane	Description
Resource Criteria	Resource Criteria	Specify the Storage Port Configuration Expressions (Name and Value) that meets the specified criteria (Equals, Not Equals, Starts with, and Ends with) based on the selected condition (All or Any).
Host Settings	Port Type	Specify the port type as Fibre or iSCSI.
	Host Group Settings	Specify the parameters required to create a new Host Group/iSCSI Target or specify an existing Host Group/iSCSI Target.
Fabric Settings	Use Fabric Settings	Specify True to enable fabric information collection.
	Connection Names	Specify the connection name defined in the Web Service Connections on the Administration tab. Separate multiple values by commas. If this value is omitted, the system uses all defined connections for the product name listed in the Web Service Connections.
	Resource Groups	Specify the switch management server resource group. Separate multiple values by commas.
	Target Fabrics	Specify the fabric name. Separate multiple values by commas. If this value is omitted, the system uses all the fabrics that the BNA monitors.

Navigation pane	Settings pane	Description
	Use Existing Zone	Specifies whether to select a predefined zone or any connectable path. If you specify True, the system selects paths within the range of the existing Zone setting. If you specify False, the system selects connectable paths regardless of the existing Zone setting.
	Number of Hops Restriction	Determines whether restrict path selection to within an assigned number of hops. When this property enabled, the service will fail if there is no path that matched the specified collection range.
	Maximum Number of Hops	When using the Number of Hops Restriction option, specify the collection range by the number of hops.
Zone Settings	Update Zone Configurations	Specify True to enable zone setting modification.
	Use Existing Zone Aliases	Specify True to use predefined Zone Aliases regardless of the naming conventions the user specifies. If you specify False, the system selects Zone Aliases that follow the naming conventions. In either case, if there are no existing Zone Aliases, the system creates new Zone Aliases that follow the naming conventions.
	Update Current Active Zone Configuration	Specify True to add a Zone to the active Zone Configuration.

Navigation pane	Settings pane	Description
	Zone Configurations to Update	To add a zone to a Zone Configuration other than the active configuration, specify the name of the Zone Configuration in which to add the zone.
	Script for Zone Naming	Specify the naming convention script that determines the Zone name for the path.
	Script for Host Zone Alias Naming	Specify the naming convention script that determines the Zone Alias name for the host port.
	Script for Storage Zone Alias Naming	Specify the naming convention script that determines the Zone Alias name for the storage port.
Copy Pair Settings	Copy Type	Specify the copy type as Clone or Snapshot.
	Number of Generations	Specify the number of secondary volumes to be created for the primary volume. The number of secondary volumes becomes the number of generations. A copy group is created for each generation as well.
	Prefix of Group Name	Specify the prefix of the copy group name to be assigned when creating the copy group. The copy group name is created by adding the prefix to the serial number of the generation.
	CTG Option	Specify whether to set the consistency group (CTG) option at pair creation. If you specify 'Enabled', a copy pair is created by using the CTG option.

Navigation pane	Settings pane	Description
Secondary Volume Settings Note: When you selected the existing volumes as target volumes, a maximum of 20 Secondary Volume Settings can be specified.	Pool	Specify the pool for S-VOL.
	Secondary Volume Settings	Specify the parameters for the Secondary Volume Settings (S-VOL).
	Volume Usage	Specify the volume usage.
	LDEV ID Starts from	Specify the startup LDEV ID as a hexadecimal number for the volume to allocate.
	Volume Label	Specify the volume label.
	LUN Starts from	Specify the starting logical unit number assigned to the volume for a host.
	Virtual LDEV ID Starts From	Specify the startup Virtual LDEV ID for the volume to allocate.
	Create Secondary Volume	Specify whether to create Secondary Volumes.
	Secondary Volume Type	Specify the volume type as DP-VOL or V-VOL.
	Average Differential Data Size Per Collection	Specify the average differential data size per collection (%).
	Primary Volume LDEV ID	Specify the Primary Volume LDEV ID.
	Select Capacity Saving Function	Specify the Capacity Saving Function for the target volumes. Refer to your storage system product documentation for the optimal setting.
	Select Capacity Saving Mode	Specify the Capacity Saving Mode for the target volumes. Refer to your storage system product documentation for the optimal setting.

Navigation pane	Settings pane	Description
Secondary Volume Resource Criteria	Resource Criteria	Specify the Storage Port Configuration Expressions (Name and Value) that meets the specified criteria (Equals, Not Equals, Starts with, and Ends with) based on the selected condition (All or Any).
Backup Host Settings	Port Type	Specify the port type for S-Vols as Fibre or iSCSI.
	Host Group Settings	Specify the parameters required to create a new Host Group/iSCSI Target or specify an existing Host Group/iSCSI Target for S-Vols.
Fabric Settings for Secondary Volumes	Use Fabric Settings	Specify True to enable fabric information collection.
	Connection Names	Specify the connection name defined in the Web Service Connections on the Administration tab. Separate multiple values by commas. If this value is omitted, the system uses all defined connections for the product name listed in the Web Service Connections.
	Resource Groups	Specify the switch management server resource group. Separate multiple values by commas.
	Target Fabrics	Specify the fabric name. Separate multiple values by commas. If this value is omitted, the system uses all the fabrics that the BNA monitors.

Navigation pane	Settings pane	Description
	Use Existing Zone	Specifies whether to select a predefined zone or any connectable path. If you specify True, the system selects paths within the range of the existing Zone setting. If you specify False, the system selects connectable paths regardless of the existing Zone setting.
	Number of Hops Restriction	Determines whether restrict path selection to within an assigned number of hops. When this property enabled, the service will fail if there is no path that matched the specified collection range.
	Maximum Number of Hops	When using the Number of Hops Restriction option, specify the collection range by the number of hops.
Zone Settings for Secondary Volumes	Update Zone Configurations	Specify True to enable zone setting modification.
	Use Existing Zone Aliases	Specify True to use predefined Zone Aliases regardless of the naming conventions the user specifies. If you specify False, the system selects Zone Aliases that follow the naming conventions. In either case, if there are no existing Zone Aliases, the system creates new Zone Aliases that follow the naming conventions.
	Update Current Active Zone Configuration	Specify True to add a Zone to the active Zone Configuration.

Navigation pane	Settings pane	Description
	Zone Configurations to Update	To add a zone to a Zone Configuration other than the active configuration, specify the name of the Zone Configuration in which to add the zone.
	Script for Zone Naming	Specify the naming convention script that determines the Zone name for the path.
	Script for Host Zone Alias Naming	Specify the naming convention script that determines the Zone Alias name for the host port.
	Script for Storage Zone Alias Naming	Specify the naming convention script that determines the Zone Alias name for the storage port.

Allocate Volumes with 2DC Remote Replication: Service details

The following service template details apply to the Allocate Volumes with 2DC Remote Replication service template.

When using this service template, be aware that you cannot specify "SSD(QLC)" for "Disk Type" in the Edit/Submit Service window. If you do not specify any "Disk Type" value, pools with all the disk type including SSD(QLC) become candidate pools. If you want to use an SSD(QLC) drive, identify a pool with SSD(QLC) by another tool (such as VSP One Block Administrator) and specify the pool for "Pool" in the Edit/Submit Service window.

Software and setup prerequisites

For software and setup prerequisites, see [Service template prerequisites \(on page 126\)](#).

Edit service settings

The following table lists the Edit service settings for the Allocate Volumes with 2DC Remote Replication service template.

Navigation pane	Settings pane	Description
Volume Settings	Configuration Manager Connection	Specify the Ops Center API Configuration Manager connection for P-Vols.

Navigation pane	Settings pane	Description
	Storage System	Specify the storage system for P-Vols.
	Target Volumes	Specify whether to use existing volumes or create new ones.
	Resource Group Selection	Specify whether to select a resource group at volume allocation. If you select "Meta resource", then the meta resource group will be selected.
	Resource Group	Specify the resource group for P-Vols.
	Pool Selection ¹	Specify whether to select a pool at volume allocation. If you select "Automatic", then a pool will be selected automatically.
	Pool	Specify the pool for P-Vols.
	Capacity Format	Specify the volume capacity format as Byte or Block.
	Volume Settings	Specify the parameters required to create new volumes for P-Vols.
	Volume Usage	Specify the volume usage.
	Number of Volumes	Specify the number of volumes.
	Volume Capacity	Depending on the chosen capacity format, specify the volume capacity in bytes or blocks (1 block = 512 bytes).
	Volume Label	Specify the volume label.
	Disk Type	Specify the disk type to be used to configure the pool. You cannot specify "SSD(QLC)".
	LDEV Setting	

Navigation pane	Settings pane	Description
	LDEV ID Starts From	Specify the startup LDEV ID as a hexadecimal number for the volume to allocate.
	Virtual LDEV ID Starts From	Specify the startup Virtual LDEV ID for the volume to allocate.
	LUN Setting	
	LUN Starts From	Specify the starting logical unit number assigned to the volume for a host.
	Volume Filter	Specify conditions for filtering the candidate volumes. Not all candidates are displayed when there are many candidate volumes. Specify the conditions to narrow down the volume list.
	Volume Filter Join Type	Specify the source volume filter join type.
	Rows Per Page	Specify the number of rows to display per page.
	Current Page	Specify the page number to display in the volumes.
	Volumes	Specify the volume to be used as the primary volume.
	Select Capacity Saving Function	Specify the Capacity Saving Function for the target volumes. Refer to your storage system product documentation for the optimal setting.
	Select Capacity Saving Mode	Specify the Capacity Saving Mode for the target volumes. Refer to your storage system product documentation for the optimal setting.

Navigation pane	Settings pane	Description
Resource Criteria	Resource Criteria	Specify the Storage Port Configuration Expressions (Name and Value) that meets the specified criteria (Equals, Not Equals, Starts with, and Ends with) based on the selected condition (All or Any).
Host Settings	Port Type	Specify the port type as Fibre or iSCSI.
	Host Mode/Host Mode Options	Specify the parameters for creating a new host group.
	Host Mode	Specify the host mode.
	Host Mode Options	Specify the host mode options.
	Number of Hosts	Select the number of hosts to allocate per volume.
	Multiple Hosts Per Storage Port	Select to share storage ports with multiple hosts.
	Multiple Hosts Per Host Group	Select to share host groups with multiple hosts.
	Host Settings	Specify information about the hosts to which the volumes will be allocated.
	Host Name	Specify the host name.
	WWN Setting	
	WWN	Specify the World Wide Name (WWN).
	WWN Nickname	Specify the WWN nickname.
	iSCSI Settings	Specify the iSCSI settings when using the iSCSI port type.
	iSCSI Name	Specify the iSCSI name.
	iSCSI Nickname	Specify the iSCSI nickname.
Fabric Settings	Use Fabric Settings	Specify True to enable fabric information collection.

Navigation pane	Settings pane	Description
	Connection Names	Specify the connection name defined in the Web Service Connections on the Administration tab. Separate multiple values by commas. If this value is omitted, the system uses all defined connections for the product name listed in the Web Service Connections.
	Resource Groups	Specify the switch management server resource group. Separate multiple values by commas.
	Target Fabrics	Specify the fabric name. Separate multiple values by commas. If this value is omitted, the system uses all the fabrics that the BNA monitors.
	Use Existing Zone	Specifies whether to select a predefined zone or any connectable path. If you specify True, the system selects paths within the range of the existing Zone setting. If you specify False, the system selects connectable paths regardless of the existing Zone setting.
	Number of Hops Restriction	Determines whether restrict path selection to within an assigned number of hops. When this property enabled, the service will fail if there is no path that matched the specified collection range.
	Maximum Number of Hops	When using the Number of Hops Restriction option, specify the collection range by the number of hops.

Navigation pane	Settings pane	Description
Zone Settings	Update Zone Configurations	Specify True to enable zone setting modification.
	Use Existing Zone Aliases	Specify True to use predefined Zone Aliases regardless of the naming conventions the user specifies. If you specify False, the system selects Zone Aliases that follow the naming conventions. In either case, if there are no existing Zone Aliases, the system creates new Zone Aliases that follow the naming conventions.
	Update Current Active Zone Configuration	Specify True to add a Zone to the active Zone Configuration.
	Zone Configurations to Update	To add a zone to a Zone Configuration other than the active configuration, specify the name of the Zone Configuration in which to add the zone.
	Script for Zone Naming	Specify the naming convention script that determines the Zone name for the path.
	Script for Host Zone Alias Naming	Specify the naming convention script that determines the Zone Alias name for the host port.
	Script for Storage Zone Alias Naming	Specify the naming convention script that determines the Zone Alias name for the storage port.
Secondary Volume Settings	Configuration Manager Connection	Specify the Ops Center API Configuration Manager connection for S-Vols.
	Storage System	Specify the storage system for S-Vols.

Navigation pane	Settings pane	Description
	Secondary Target Volumes	Specify whether to use existing volumes or create new ones.
	Secondary Resource Group Selection	Specify whether to select a resource group at volume allocation. If you select 'Meta resource', then the meta resource group will be selected.
	Resource Group	Specify the resource group for S-Vols.
	Secondary Pool Selection ¹	Specify whether to select a pool at volume allocation. If you select "Automatic", then a pool will be selected automatically.
	Pool	Specify the pool for S-Vols.
	Secondary Volume Settings	Specify the parameters for the Secondary Volume Settings (S-Vol).
	Primary Volume LDEV ID	Specify the primary volume LDEV ID.
	Volume Usage	Specify the volume usage.
	Volume Label	Specify the volume label.
	Disk Type	Specify the disk type to be used to configure the pool. You cannot specify "SSD(QLC)".
	LDEV Setting	
	LDEV ID Starts From	Specify the startup LDEV ID as a hexadecimal number for the volume to allocate.
	Virtual LDEV ID Starts From	Specify the startup virtual LDEV ID as a hexadecimal number for the volume to allocate.
	LUN Setting	

Navigation pane	Settings pane	Description
	LUN Starts From	Specify the starting logical unit number assigned to the volume for a host.
	Secondary Volume Filter	Specify conditions for filtering the candidate volumes. Not all candidates are displayed when there are many candidate volumes. Specify the conditions to narrow down the volume list.
	Secondary Volume Filter Join Type	Specify the secondary volume filter join type.
	Rows Per Page	Specify the number of rows to display per page.
	Current Page	Specify the page number to display in the volumes.
	Secondary Volumes	Specify the volume to be used as the secondary volume.
	Select Capacity Saving Function	Specify the Capacity Saving Function for the target volumes. Refer to your storage system product documentation for the optimal setting.
	Select Capacity Saving Mode	Specify the Capacity Saving Mode for the target volumes. Refer to your storage system product documentation for the optimal setting.
Secondary Volume Resource Criteria	Resource Criteria	Specify the Storage Port Configuration Expressions (Name and Value) that meets the specified criteria (Equals, Not Equals, Starts with, and Ends with) based on the selected condition (All or Any).
Backup Host Settings	Port Type	Specify the port type as Fibre or iSCSI.

Navigation pane	Settings pane	Description
	Secondary Host Mode/ Secondary Host Mode Options	Specify the parameters for creating a new host group.
	Host Mode	Specify the host mode.
	Host Mode Options	Specify the host mode options.
	Secondary Number of Hosts	Select the number of hosts to allocate per volume.
	Secondary Multiple Hosts Per Storage Port	Select to share storage ports with multiple hosts.
	Secondary Multiple Hosts Per Host Group	Select to share host groups with multiple hosts.
	Secondary Host Settings	Specify information about the hosts for which the volumes will be allocated.
	Host Name	Specify the host name.
	WWN Settings	Specify the WWN settings when using the Fibre port setting.
	WWN	Specify the World Wide Name (WWN).
	WWN Nickname	Specify the WWN nickname.
	iSCSI Settings	Specify the iSCSI settings when using the iSCSI port type.
	iSCSI Name	Specify the iSCSI name.
	iSCSI Nickname	Specify the iSCSI nickname.
Fabric Settings for Secondary Volumes	Use Fabric Settings	Specify True to enable fabric information collection.

Navigation pane	Settings pane	Description
	Connection Names	Specify the connection name defined in the Web Service Connections on the Administration tab. Separate multiple values by commas. If this value is omitted, the system uses all defined connections for the product name listed in the Web Service Connections.
	Resource Groups	Specify the switch management server resource group. Separate multiple values by commas.
	Target Fabrics	Specify the fabric name. Separate multiple values by commas. If this value is omitted, the system uses all the fabrics that the BNA monitors.
	Use Existing Zone	Specifies whether to select a predefined zone or any connectable path. If you specify True, the system selects paths within the range of the existing Zone setting. If you specify False, the system selects connectable paths regardless of the existing Zone setting.
	Number of Hops Restriction	Determines whether restrict path selection to within an assigned number of hops. When this property enabled, the service will fail if there is no path that matched the specified collection range.
	Maximum Number of Hops	When using the Number of Hops Restriction option, specify the collection range by the number of hops.

Navigation pane	Settings pane	Description
Zone Settings for Secondary Volumes	Update Zone Configurations	Specify True to enable zone setting modification.
	Use Existing Zone Aliases	Specify True to use predefined Zone Aliases regardless of the naming conventions the user specifies. If you specify False, the system selects Zone Aliases that follow the naming conventions. In either case, if there are no existing Zone Aliases, the system creates new Zone Aliases that follow the naming conventions.
	Update Current Active Zone Configuration	Specify True to add a Zone to the active Zone Configuration.
	Zone Configurations to Update	To add a zone to a Zone Configuration other than the active configuration, specify the name of the Zone Configuration in which to add the zone.
	Script for Zone Naming	Specify the naming convention script that determines the Zone name for the path.
	Script for Host Zone Alias Naming	Specify the naming convention script that determines the Zone Alias name for the host port.
	Script for Storage Zone Alias Naming	Specify the naming convention script that determines the Zone Alias name for the storage port.
Copy Pair Settings	Replication Type	Specify the pair type.
Note: The maximum number of copy pairs you can create is 99.	Target Copy Group	Specify whether to use an existing copy group or create a new one.

Navigation pane	Settings pane	Description
	Copy Group Name	Specify the name of the new copy group to create.
	Copy Pace	Specify the copy speed. The larger the value specified, the faster the copy speed will be.
	Fence Level	Specify the fence level.
	Use the nocopy option	Specify whether to perform an initial copy when creating a pair.
	Assign CTG	Specify whether to register the new pairs in a consistency group.
	Reduction Force Copy	Specify whether to forcibly create a pair for the volume for which the capacity saving function (deduplication and compression) is enabled.
	Primary JNLG	Specify the journal group of the primary volume.
	Secondary JNLG	Specify the journal group of the secondary volume.
	CTG ID	Specify whether to select the consistency group ID automatically or manually.
	CTG ID - Manual Selection	Specify the consistency group ID.
	MU Number	Specify whether to select the mirror unit (MU) automatically or manually.
	MU Number - Manual Selection	Specify the mirror unit (MU) mirror unit number by using a number from 0 to 3.
	Path Group ID	Specify whether to select the path group ID automatically or manually.

Navigation pane	Settings pane	Description
	Path Group ID - Manual Selection	Specify the path group ID by using a hexadecimal (base 16) number in the range from 00 to FF.
	Delta Resync Suspend	Specify whether to use delta resync between the storage systems of the secondary sites.
	Copy Group	Specify the existing copy group.
<p>Note:</p> <ol style="list-style-type: none"> 1. If you select Automatic for Pool Selection in the Volume Settings panel of the Edit/Submit Service window, the largest free pool capacity will be selected after volume allocation. 		

Submit service settings

The following table lists the Submit service settings for the Allocate Volumes with 2DC Remote Replication service template.

Navigation pane	Settings pane	Description
Volume Settings	Configuration Manager Connection	Specify the Ops Center API Configuration Manager connection for P-Vols.
	Storage System	Specify the storage system for P-Vols.
	Target Volumes	Specify whether to use existing volumes or create new ones.
	Resource Group Selection	Specify whether to select a resource group at volume allocation. If you select "Meta resource", then the meta resource group will be selected.
	Resource Group	Specify the resource group for P-Vols.

Navigation pane	Settings pane	Description
	Pool Selection ¹	Specify whether to select a pool at volume allocation. If you select "Automatic", then a pool will be selected automatically.
	Pool	Specify the pool for P-Vols.
	Capacity Format	Specify the volume capacity format as Byte or Block.
	Volume Settings	Specify the parameters required to create new volumes for P-Vols.
	Volume Usage	Specify the volume usage.
	Number of Volumes	Specify the number of volumes.
	Volume Capacity	Depending on the chosen capacity format, specify the volume capacity in bytes or blocks (1 block = 512 bytes).
	Volume Label	Specify the volume label.
	Disk Type	Specify the disk type to be used to configure the pool. You cannot specify "SSD(QLC)".
	LDEV Setting	
	LDEV ID Starts From	Specify the startup LDEV ID as a hexadecimal number for the volume to allocate.
	Virtual LDEV ID Starts From	Specify the startup Virtual LDEV ID for the volume to allocate.
	LUN Setting	
	LUN Starts From	Specify the starting logical unit number assigned to the volume for a host.

Navigation pane	Settings pane	Description
	Volume Filter	Specify conditions for filtering the candidate volumes. Not all candidates are displayed when there are many candidate volumes. Specify the conditions to narrow down the volume list.
	Volume Filter Join Type	Specify the source volume filter join type.
	Rows Per Page	Specify the number of rows to display per page.
	Current Page	Specify the page number to display in the volumes.
	Volumes	Specify the volume to be used as the primary volume.
	Select Capacity Saving Function	Specify the Capacity Saving Function for the target volumes. Refer to your storage system product documentation for the optimal setting.
	Select Capacity Saving Mode	Specify the Capacity Saving Mode for the target volumes. Refer to your storage system product documentation for the optimal setting.
Resource Criteria	Resource Criteria	Specify the Storage Port Configuration Expressions (Name and Value) that meets the specified criteria (Equals, Not Equals, Starts with, and Ends with) based on the selected condition (All or Any).
Host Settings	Port Type	Specify the port type as Fibre or iSCSI.
	Host Mode/Host Mode Options	Specify the parameters for creating a new host group.
	Host Mode	Specify the host mode.

Navigation pane	Settings pane	Description
	Host Mode Options	Specify the host mode options.
	Number of Hosts	Select the number of hosts to allocate per volume.
	Multiple Hosts Per Storage Port	Select to share storage ports with multiple hosts.
	Multiple Hosts Per Host Group	Select to share host groups with multiple hosts.
	Host Settings	Specify information about the hosts to which the volumes will be allocated.
	Host Name	Specify the host name.
	WWN Setting	
	WWN	Specify the World Wide Name (WWN).
	WWN Nickname	Specify the WWN nickname.
	iSCSI Settings	Specify the iSCSI settings when using the iSCSI port type.
	iSCSI Name	Specify the iSCSI name.
	iSCSI Nickname	Specify the iSCSI nickname.
Fabric Settings	Use Fabric Settings	Specify True to enable fabric information collection.
	Connection Names	Specify the connection name defined in the Web Service Connections on the Administration tab. Separate multiple values by commas. If this value is omitted, the system uses all defined connections for the product name listed in the Web Service Connections.
	Resource Groups	Specify the switch management server resource group. Separate multiple values by commas.

Navigation pane	Settings pane	Description
	Target Fabrics	Specify the fabric name. Separate multiple values by commas. If this value is omitted, the system uses all the fabrics that the BNA monitors.
	Use Existing Zone	Specifies whether to select a predefined zone or any connectable path. If you specify True, the system selects paths within the range of the existing Zone setting. If you specify False, the system selects connectable paths regardless of the existing Zone setting.
	Number of Hops Restriction	Determines whether restrict path selection to within an assigned number of hops. When this property enabled, the service will fail if there is no path that matched the specified collection range.
	Maximum Number of Hops	When using the Number of Hops Restriction option, specify the collection range by the number of hops.
Zone Settings	Update Zone Configurations	Specify True to enable zone setting modification.
	Use Existing Zone Aliases	Specify True to use predefined Zone Aliases regardless of the naming conventions the user specifies. If you specify False, the system selects Zone Aliases that follow the naming conventions. In either case, if there are no existing Zone Aliases, the system creates new Zone Aliases that follow the naming conventions.

Navigation pane	Settings pane	Description
	Update Current Active Zone Configuration	Specify True to add a Zone to the active Zone Configuration.
	Zone Configurations to Update	To add a zone to a Zone Configuration other than the active configuration, specify the name of the Zone Configuration in which to add the zone.
	Script for Zone Naming	Specify the naming convention script that determines the Zone name for the path.
	Script for Host Zone Alias Naming	Specify the naming convention script that determines the Zone Alias name for the host port.
	Script for Storage Zone Alias Naming	Specify the naming convention script that determines the Zone Alias name for the storage port.
Secondary Volume Settings	Configuration Manager Connection	Specify the Ops Center API Configuration Manager connection for S-Vols.
	Storage System	Specify the storage system for S-Vols.
	Secondary Target Volumes	Specify whether to use existing volumes or create new ones.
	Secondary Resource Group Selection	Specify whether to select a resource group at volume allocation. If you select 'Meta resource', then the meta resource group will be selected.
	Resource Group	Specify the resource group for S-Vols.

Navigation pane	Settings pane	Description
	Secondary Pool Selection ¹	Specify whether to select a pool at volume allocation. If you select "Automatic", then a pool will be selected automatically.
	Pool	Specify the pool for S-Vols.
	Secondary Volume Settings	Specify the parameters for the Secondary Volume Settings (S-Vol).
	Primary Volume LDEV ID	Specify the primary volume LDEV ID.
	Volume Usage	Specify the volume usage.
	Volume Label	Specify the volume label.
	LDEV Setting	
	LDEV ID Starts From	Specify the startup LDEV ID as a hexadecimal number for the volume to allocate.
	Virtual LDEV ID Starts From	Specify the startup virtual LDEV ID as a hexadecimal number for the volume to allocate.
	Disk Type	Specify the disk type to be used to configure the pool. You cannot specify "SSD(QLC)".
	LUN Setting	
	LUN Starts From	Specify the starting logical unit number assigned to the volume for a host.
	Secondary Volume Filter	Specify conditions for filtering the candidate volumes. Not all candidates are displayed when there are many candidate volumes. Specify the conditions to narrow down the volume list.

Navigation pane	Settings pane	Description
	Secondary Volume Filter Join Type	Specify the secondary volume filter join type.
	Rows Per Page	Specify the number of rows to display per page.
	Current Page	Specify the page number to display in the volumes.
	Secondary Volumes	Specify the volume to be used as the secondary volume.
	Select Capacity Saving Function	Specify the Capacity Saving Function for the target volumes. Refer to your storage system product documentation for the optimal setting.
	Select Capacity Saving Mode	Specify the Capacity Saving Mode for the target volumes. Refer to your storage system product documentation for the optimal setting.
Secondary Volume Resource Criteria	Resource Criteria	Specify the Storage Port Configuration Expressions (Name and Value) that meets the specified criteria (Equals, Not Equals, Starts with, and Ends with) based on the selected condition (All or Any).
Backup Host Settings	Port Type	Specify the port type as Fibre or iSCSI.
	Secondary Host Mode/ Secondary Host Mode Options	Specify the parameters for creating a new host group.
	Host Mode	Specify the host mode.
	Host Mode Options	Specify the host mode options.
	Secondary Number of Hosts	Select the number of hosts to allocate per volume.

Navigation pane	Settings pane	Description
	Secondary Multiple Hosts Per Storage Port	Select to share storage ports with multiple hosts.
	Secondary Multiple Hosts Per Host Group	Select to share host groups with multiple hosts.
	Secondary Host Settings	Specify information about the hosts for which the volumes will be allocated.
	Host Name	Specify the host name.
	WWN Settings	Specify the WWN settings when using the Fibre port setting.
	WWN	Specify the World Wide Name (WWN).
	WWN Nickname	Specify the WWN nickname.
	iSCSI Settings	Specify the iSCSI settings when using the iSCSI port type.
	iSCSI Name	Specify the iSCSI name.
	iSCSI Nickname	Specify the iSCSI nickname.
Fabric Settings for Secondary Volumes	Use Fabric Settings	Specify True to enable fabric information collection.
	Connection Names	Specify the connection name defined in the Web Service Connections on the Administration tab. Separate multiple values by commas. If this value is omitted, the system uses all defined connections for the product name listed in the Web Service Connections.
	Resource Groups	Specify the switch management server resource group. Separate multiple values by commas.

Navigation pane	Settings pane	Description
	Target Fabrics	Specify the fabric name. Separate multiple values by commas. If this value is omitted, the system uses all the fabrics that the BNA monitors.
	Use Existing Zone	Specifies whether to select a predefined zone or any connectable path. If you specify True, the system selects paths within the range of the existing Zone setting. If you specify False, the system selects connectable paths regardless of the existing Zone setting.
	Number of Hops Restriction	Determines whether restrict path selection to within an assigned number of hops. When this property enabled, the service will fail if there is no path that matched the specified collection range.
	Maximum Number of Hops	When using the Number of Hops Restriction option, specify the collection range by the number of hops.
Zone Settings for Secondary Volumes	Update Zone Configurations	Specify True to enable zone setting modification.
	Use Existing Zone Aliases	Specify True to use predefined Zone Aliases regardless of the naming conventions the user specifies. If you specify False, the system selects Zone Aliases that follow the naming conventions. In either case, if there are no existing Zone Aliases, the system creates new Zone Aliases that follow the naming conventions.

Navigation pane	Settings pane	Description
	Update Current Active Zone Configuration	Specify True to add a Zone to the active Zone Configuration.
	Zone Configurations to Update	To add a zone to a Zone Configuration other than the active configuration, specify the name of the Zone Configuration in which to add the zone.
	Script for Zone Naming	Specify the naming convention script that determines the Zone name for the path.
	Script for Host Zone Alias Naming	Specify the naming convention script that determines the Zone Alias name for the host port.
	Script for Storage Zone Alias Naming	Specify the naming convention script that determines the Zone Alias name for the storage port.
Copy Pair Settings Note: The maximum number of copy pairs you can create is 99.	Replication Type	Specify the pair type.
	Target Copy Group	Specify whether to use an existing copy group or create a new one.
	Copy Group Name	Specify the name of the new copy group to create.
	Copy Pace	Specify the copy speed. The larger the value specified, the faster the copy speed will be.
	Fence Level	Specify the fence level.
	Use the nocopy option	Specify whether to perform an initial copy when creating a pair.
	Assign CTG	Specify whether to register the new pairs in a consistency group.

Navigation pane	Settings pane	Description
	Reduction Force Copy	Specify whether to forcibly create a pair for the volume for which the capacity saving function (deduplication and compression) is enabled.
	Primary JNLG	Specify the journal group of the primary volume.
	Secondary JNLG	Specify the journal group of the secondary volume.
	CTG ID	Specify whether to select the consistency group ID automatically or manually.
	CTG ID - Manual Selection	Specify the consistency group ID.
	MU Number	Specify whether to select the mirror unit (MU) automatically or manually.
	MU Number - Manual Selection	Specify the mirror unit (MU) mirror unit number by using a number from 0 to 3.
	Path Group ID	Specify whether to select the path group ID automatically or manually.
	Path Group ID - Manual Selection	Specify the path group ID by using a hexadecimal (base 16) number in the range from 00 to FF.
	Delta Resync Suspend	Specify whether to use delta resync between the storage systems of the secondary sites.
	Copy Group	Specify the existing copy group.
<p>Note:</p> <ol style="list-style-type: none"> 1. If you select Automatic for Pool Selection in the Volume Settings panel of the Edit/ Submit Service window, the largest free pool capacity will be selected after volume allocation. 		

Allocate Volumes with Remote Replication (Global-Active Device): Service details

This service allocates sets of volumes with in-system replication (global-active device) from the associated infrastructure group through Ops Center API Configuration Manager to be consumed by servers running a generic application.

When using this service template, be aware that you cannot specify "SSD(QLC)" for "Disk Type" in the Edit/Submit Service window. If you do not specify any "Disk Type" value, pools with all the disk type including SSD(QLC) become candidate pools. If you want to use an SSD(QLC) drive, identify a pool with SSD(QLC) by another tool (such as VSP One Block Administrator) and specify the pool for "Pool" in the Edit/Submit Service window.

Software and setup prerequisites

For software and setup prerequisites, see [Service template prerequisites \(on page 126\)](#).

Edit service settings

The following table lists the Edit service settings for the Allocate Volumes with Remote Replication (Global-Active Device) service template.

Navigation pane	Settings pane	Description
Volume Settings	Configuration Manager Connection	Specify the Ops Center API Configuration Manager connection for P-Vols.
	Storage System	Specify the storage system for P-Vols.
	Target Volumes	Specify whether to use existing volumes or create new ones.
	Resource Group	Specify the resource group for P-Vols.
	Pool Selection ¹	Specify whether to select a pool at volume allocation. If you select "Automatic", then a pool will be selected automatically.
	Pool	Specify the pool for P-Vols.
	Capacity Format	Specify the volume capacity format as Byte or Block.
	Volume Settings	Specify the parameters required to create new volumes for P-Vols.
	Volume Usage	Specify the volume usage.
	Number of Volumes	Specify the number of volumes.
	Volume Capacity	Depending on the chosen capacity format, specify the volume capacity in bytes or blocks (1 block = 512 bytes).

Navigation pane	Settings pane	Description
	Volume Label	Specify the volume label.
	Disk Type	Specify the disk type to be used to configure the pool. You cannot specify "SSD(QLC)".
	LDEV Setting	
	LDEV ID Starts From	Specify the startup LDEV ID as a hexadecimal number for the volume to allocate.
	Virtual LDEV ID Starts From	Specify the startup virtual LDEV ID for the volume to allocate.
	LUN Setting	
	LUN Starts From	Specify the starting logical unit number assigned to the volume for a host.
	Volume Filter	Specify conditions for filtering the candidate volumes. Not all candidates are displayed when there are many candidate volumes. Specify the conditions to narrow down the volume list.
	Volume Filter Join Type	Specify the source volume filter join type.
	Rows per Page	Specify the number of rows to display per page.
	Current Page	Specify the page number to display in the volumes.
	Volumes	Specify the volume to be used as the primary volume.
	Select Capacity Saving Function	Specify the Capacity Saving Function for the target volumes. Refer to your storage system product documentation for the optimal setting.
	Select Capacity Saving Mode	Specify the Capacity Saving Mode for the target volumes. Refer to your storage system product documentation for the optimal setting.
Resource Criteria	Resource Criteria	Specify the Storage Port Configuration Expressions (Name and Value) that meets the specified criteria (Equals, Not Equals, Starts with, and Ends with) based on the selected condition (All or Any).

Navigation pane	Settings pane	Description
Host Settings	Port Type	Specify the port type as Fibre or iSCSI.
	Host Mode/Host Mode Options	Specify the parameters for creating a new host group.
	Host Mode	Specify the host mode.
	Host Mode Options	Specify the host mode options.
	Number of Hosts	Select the number of hosts to allocate per volume.
	Multiple Hosts Per Storage Port	Select to share storage ports with multiple hosts.
	Multiple Hosts Per Host Group	Select to share host groups with multiple hosts.
	Host Settings	Specify information about the hosts to which the volumes will be allocated.
	Host Name	Specify the host name.
	WWN Settings	
	WWN	Specify the World Wide Name (WWN).
	WWN Nickname	Specify the WWN nickname.
	Enable ALUA on Preferred Path	Enable ALUA on the preferred path.
	Enable Host Mode Option on Non-preferred Path	Enable the Host Mode option on the non-preferred path.
	iSCSI Settings	Specify the iSCSI settings when using the iSCSI port type.
	iSCSI Name	Specify the iSCSI name.
	iSCSI Nickname	Specify the iSCSI nickname.
Fabric Settings	Use Fabric Settings	Specify True to enable fabric information collection.
	Connection Names	Specify the connection name defined in the Web Service Connections on the Administration tab. Separate multiple values by commas. If this value is omitted, the system uses all defined connections for the product name listed in the Web Service Connections.

Navigation pane	Settings pane	Description
	Resource Groups	Specify the switch management server resource group. Separate multiple values by commas.
	Target Fabrics	Specify the fabric name. Separate multiple values by commas. If this value is omitted, the system uses all the fabrics that the BNA monitors.
	Use Existing Zone	Specifies whether to select a predefined zone or any connectable path. If you specify True, the system selects paths within the range of the existing Zone setting. If you specify False, the system selects connectable paths regardless of the existing Zone setting.
	Number of Hops Restriction	Determines whether restrict path selection to within an assigned number of hops. When this property enabled, the service will fail if there is no path that matched the specified collection range.
	Maximum Number of Hops	When using the Number of Hops Restriction option, specify the collection range by the number of hops.
Zone Settings	Update Zone Configurations	Specify True to enable zone setting modification.
	Use Existing Zone Aliases	Specify True to use predefined Zone Aliases regardless of the naming conventions the user specifies. If you specify False, the system selects Zone Aliases that follow the naming conventions. In either case, if there are no existing Zone Aliases, the system creates new Zone Aliases that follow the naming conventions.
	Update Current Active Zone Configuration	Specify True to add a Zone to the active Zone Configuration.
	Zone Configurations to Update	To add a zone to a Zone Configuration other than the active configuration, specify the name of the Zone Configuration in which to add the zone.
	Script for Zone Naming	Specify the naming convention script that determines the Zone name for the path.

Navigation pane	Settings pane	Description
	Script for Host Zone Alias Naming	Specify the naming convention script that determines the Zone Alias name for the host port.
	Script for Storage Zone Alias Naming	Specify the naming convention script that determines the Zone Alias name for the storage port.
Secondary Volume Settings	Configuration Manager Connection	Specify the Ops Center API Configuration Manager connection for S-Vols.
	Storage System	Specify the storage system for S-Vols.
	Resource Group	Specify the resource group for S-Vols.
	Secondary Pool Selection ¹	Specify whether to select a pool at volume allocation. If you select 'Automatic', then a pool will be selected automatically.
	Pool	Specify the pool for S-Vols.
	Secondary Volume Settings	Specify the parameters required to create new volumes for S-Vols.
	Primary Volume LDEV ID	Specify the primary volume LDEV ID.
	Volume Usage	Specify the volume usage.
	Volume Label	Specify the volume label.
	Disk Type	Specify the disk type to be used to configure the pool. You cannot specify "SSD(QLC)".
	LDEV Setting	
	LDEV ID Starts From	Specify the startup LDEV ID as a hexadecimal number for the volume to allocate.
	LUN Setting	
	LUN Starts From	Specify the starting logical unit number assigned to the volume for a host.
	Select Capacity Saving Function	Specify the Capacity Saving Function for the target volumes. Refer to your storage system product documentation for the optimal setting.

Navigation pane	Settings pane	Description
	Select Capacity Saving Mode	Specify the Capacity Saving Mode for the target volumes. Refer to your storage system product documentation for the optimal setting.
Secondary Volume Resource Criteria	Resource Criteria	Specify the Storage Port Configuration Expressions (Name and Value) that meets the specified criteria (Equals, Not Equals, Starts with, and Ends with) based on the selected condition (All or Any).
Backup Host Settings	Port Type	Specify the port type as Fibre or iSCSI.
	Secondary Host Mode/Secondary Host Mode Options	Specify the parameters for creating a new host group.
	Host Mode	Specify the host mode.
	Host Mode Options	Specify the host mode options.
	Secondary Number of Hosts	Select the number of hosts to allocate per volume.
	Secondary Multiple Hosts Per Storage Port	Select to share storage ports with multiple hosts.
	Secondary Multiple Hosts Per Host Group	Select to share host groups with multiple hosts.
	Secondary Host Settings	Specify information about the hosts for which the volumes will be allocated.
	Host Name	Specify the host name.
	WWN Settings	Specify the WWN settings when using the Fibre port setting.
	WWN	Specify the World Wide Name (WWN).
	WWN Nickname	Specify the WWN nickname.
	Enable ALUA on Preferred Path	Enable ALUA on the preferred path.
	Enable Host Mode Option on Non-preferred Path	Enable the Host Mode option on the non-preferred path.
	iSCSI Settings	Specify the iSCSI settings when using the iSCSI port type.

Navigation pane	Settings pane	Description
	iSCSI Name	Specify the iSCSI name.
	iSCSI Nickname	Specify the iSCSI nickname.
Fabric Settings for Secondary Volumes	Use Fabric Settings	Specify True to enable fabric information collection.
	Connection Names	Specify the connection name defined in the Web Service Connections on the Administration tab. Separate multiple values by commas. If this value is omitted, the system uses all defined connections for the product name listed in the Web Service Connections.
	Resource Groups	Specify the switch management server resource group. Separate multiple values by commas.
	Target Fabrics	Specify the fabric name. Separate multiple values by commas. If this value is omitted, the system uses all the fabrics that the BNA monitors.
	Use Existing Zone	Specifies whether to select a predefined zone or any connectable path. If you specify True, the system selects paths within the range of the existing Zone setting. If you specify False, the system selects connectable paths regardless of the existing Zone setting.
	Number of Hops Restriction	Determines whether restrict path selection to within an assigned number of hops. When this property enabled, the service will fail if there is no path that matched the specified collection range.
	Maximum Number of Hops	When using the Number of Hops Restriction option, specify the collection range by the number of hops.
Zone Settings for Secondary Volumes	Update Zone Configurations	Specify True to enable zone setting modification.

Navigation pane	Settings pane	Description
	Use Existing Zone Aliases	Specify True to use predefined Zone Aliases regardless of the naming conventions the user specifies. If you specify False, the system selects Zone Aliases that follow the naming conventions. In either case, if there are no existing Zone Aliases, the system creates new Zone Aliases that follow the naming conventions.
	Update Current Active Zone Configuration	Specify True to add a Zone to the active Zone Configuration.
	Zone Configurations to Update	To add a zone to a Zone Configuration other than the active configuration, specify the name of the Zone Configuration in which to add the zone.
	Script for Zone Naming	Specify the naming convention script that determines the Zone name for the path.
	Script for Host Zone Alias Naming	Specify the naming convention script that determines the Zone Alias name for the host port.
	Script for Storage Zone Alias Naming	Specify the naming convention script that determines the Zone Alias name for the storage port.
Copy Pair Settings Note: The maximum number of copy pairs you can create is 99.	Target Copy Group	Specify whether to use an existing copy group or create a new one.
	Copy Group Name	Specify the name of the new copy group to create.
	Copy Pace	Specify the copy speed. The larger the value specified, the faster the copy speed will be.
	Use the nocopy option	Specify whether to perform an initial copy when creating a pair.
	Assign CTG	Specify whether to register the new pairs in a consistency group.
	CTG ID	Specify whether to select the consistency group ID automatically or manually.
	CTG ID - Manual Selection	Specify the consistency group ID by using a hexadecimal (base 16) number.
	MU Number	Specify whether to select the mirror unit (MU) automatically or manually.

Navigation pane	Settings pane	Description
	MU Number - Manual Selection	Specify the mirror unit (MU) mirror unit number by using a number from 0 to 3.
	Path Group ID	Specify whether to select the path group ID automatically or manually. If you specify "Auto Selection", 0 is automatically chosen.
	Path Group ID - Manual Selection	Specify the path group ID by using a hexadecimal (base 16) number in the range from 00 to FF.
	Reduction Force Copy	Specify whether to forcibly create a pair for the volume for which the capacity saving function (deduplication and compression) is enabled.
	Quorum Disk ID	Specify the Quorum disk ID.
	Copy Group	Specify the existing copy group.
<p>Note:</p> <ol style="list-style-type: none"> 1. If you select Automatic for Pool Selection in the Volume Settings panel of the Edit/Submit Service window, the largest free pool capacity will be selected after volume allocation. 		

Submit service settings

The following table lists the Submit service settings for the Allocate Volumes with Remote Replication (Global-Active Device) service template.

Navigation pane	Settings pane	Description
Volume Settings	Configuration Manager Connection	Specify the Ops Center API Configuration Manager connection for P-Vols.
	Storage System	Specify the storage system for P-Vols.
	Target Volumes	Specify whether to use existing volumes or create new ones.
	Resource Group	Specify the resource group for P-Vols.
	Pool Selection ¹	Specify whether to select pool at volume allocation. If you select "Automatic", then a pool will be selected automatically.
	Pool	Specify the pool for P-Vols.
	Capacity Format	Specify the volume capacity format as Byte or Block.

Navigation pane	Settings pane	Description
	Volume Settings	Specify the parameters required to create new volumes for P-Vols.
	Volume Usage	Specify the volume usage.
	Number of Volumes	Specify the number of volumes.
	Volume Capacity	Depending on the chosen capacity format, specify the volume capacity in bytes or blocks (1 block = 512 bytes).
	Volume Label	Specify the volume label.
	Disk Type	Specify the disk type to be used to configure the pool. You cannot specify "SSD(QLC)".
	LDEV Setting	
	LDEV ID Starts From	Specify the startup LDEV ID as a hexadecimal number for the volume to allocate.
	Virtual LDEV ID Starts From	Specify the startup virtual LDEV ID for the volume to allocate.
	LUN Setting	
	LUN Starts From	Specify the starting logical unit number assigned to the volume for a host.
	Volume Filter	Specify conditions for filtering the candidate volumes. Not all candidates are displayed when there are many candidate volumes. Specify the conditions to narrow down the volume list.
	Volume Filter Join Type	Specify the source volume filter join type.
	Rows per Page	Specify the number of rows to display per page.
	Current Page	Specify the page number to display in the volumes.
	Volumes	Specify the volume to be used as the primary volume.
	Select Capacity Saving Function	Specify the Capacity Saving Function for the target volumes. Refer to your storage system product documentation for the optimal setting.

Navigation pane	Settings pane	Description
	Select Capacity Saving Mode	Specify the Capacity Saving Mode for the target volumes. Refer to your storage system product documentation for the optimal setting.
Resource Criteria	Resource Criteria	Specify the Storage Port Configuration Expressions (Name and Value) that meets the specified criteria (Equals, Not Equals, Starts with, and Ends with) based on the selected condition (All or Any).
Host Settings	Port Type	Specify the port type as Fibre or iSCSI.
	Host Mode/Host Mode Options	Specify the parameters for creating a new host group.
	Host Mode	Specify the host mode.
	Host Mode Options	Specify the host mode options.
	Number of Hosts	Select the number of hosts to allocate per volume.
	Multiple Hosts Per Storage Port	Select to share storage ports with multiple hosts.
	Multiple Hosts Per Host Group	Select to share host groups with multiple hosts.
	Host Settings	Specify information about the hosts to which the volumes will be allocated.
	Host Name	Specify the host name.
	WWN Settings	
	WWN	Specify the World Wide Name (WWN).
	WWN Nickname	Specify the WWN nickname.
	Enable ALUA on Preferred Path	Enable ALUA on the preferred path.
	Enable Host Mode Option on Non-preferred Path	Enable the Host Mode option on the non-preferred path.
	iSCSI Settings	Specify the iSCSI settings when using the iSCSI port type.
	iSCSI Name	Specify the iSCSI name.
	iSCSI Nickname	Specify the iSCSI nickname.

Navigation pane	Settings pane	Description
Fabric Settings	Use Fabric Settings	Specify True to enable fabric information collection.
	Connection Names	Specify the connection name defined in the Web Service Connections on the Administration tab. Separate multiple values by commas. If this value is omitted, the system uses all defined connections for the product name listed in the Web Service Connections.
	Resource Groups	Specify the switch management server resource group. Separate multiple values by commas.
	Target Fabrics	Specify the fabric name. Separate multiple values by commas. If this value is omitted, the system uses all the fabrics that the BNA monitors.
	Use Existing Zone	Specifies whether to select a predefined zone or any connectable path. If you specify True, the system selects paths within the range of the existing Zone setting. If you specify False, the system selects connectable paths regardless of the existing Zone setting.
	Number of Hops Restriction	Determines whether restrict path selection to within an assigned number of hops. When this property enabled, the service will fail if there is no path that matched the specified collection range.
	Maximum Number of Hops	When using the Number of Hops Restriction option, specify the collection range by the number of hops.
Zone Settings	Update Zone Configurations	Specify True to enable zone setting modification.
	Use Existing Zone Aliases	Specify True to use predefined Zone Aliases regardless of the naming conventions the user specifies. If you specify False, the system selects Zone Aliases that follow the naming conventions. In either case, if there are no existing Zone Aliases, the system creates new Zone Aliases that follow the naming conventions.

Navigation pane	Settings pane	Description
	Update Current Active Zone Configuration	Specify True to add a Zone to the active Zone Configuration.
	Zone Configurations to Update	To add a zone to a Zone Configuration other than the active configuration, specify the name of the Zone Configuration in which to add the zone.
	Script for Zone Naming	Specify the naming convention script that determines the Zone name for the path.
	Script for Host Zone Alias Naming	Specify the naming convention script that determines the Zone Alias name for the host port.
	Script for Storage Zone Alias Naming	Specify the naming convention script that determines the Zone Alias name for the storage port.
Secondary Volume Settings	Configuration Manager Connection	Specify the Ops Center API Configuration Manager connection for S-Vols.
	Storage System	Specify the storage system for S-Vols.
	Resource Group	Specify the resource group for S-Vols.
	Secondary Pool Selection ¹	Specify whether to select a pool at volume allocation. If you select 'Automatic', then a pool will be selected automatically.
	Pool	Specify the pool for S-Vols.
	Secondary Volume Settings	Specify the parameters required to create new volumes for S-Vols.
	Primary Volume LDEV ID	Specify the primary volume LDEV ID.
	Volume Usage	Specify the volume usage.
	Volume Label	Specify the volume label.
	Disk Type	Specify the disk type to be used to configure the pool. You cannot specify "SSD(QLC)".
	LDEV Setting	
	LDEV ID Starts From	Specify the startup LDEV ID as a hexadecimal number for the volume to allocate.

Navigation pane	Settings pane	Description
	LUN Setting	
	LUN Starts From	Specify the starting logical unit number assigned to the volume for a host.
	Select Capacity Saving Function	Specify the Capacity Saving Function for the target volumes. Refer to your storage system product documentation for the optimal setting.
	Select Capacity Saving Mode	Specify the Capacity Saving Mode for the target volumes. Refer to your storage system product documentation for the optimal setting.
Secondary Volume Resource Criteria	Resource Criteria	Specify the Storage Port Configuration Expressions (Name and Value) that meets the specified criteria (Equals, Not Equals, Starts with, and Ends with) based on the selected condition (All or Any).
Backup Host Settings	Port Type	Specify the port type as Fibre or iSCSI.
	Secondary Host Mode/Secondary Host Mode Options	Specify the parameters for creating a new host group.
	Host Mode	Specify the host mode.
	Host Mode Options	Specify the host mode options.
	Secondary Number of Hosts	Select the number of hosts to allocate per volume.
	Secondary Multiple Hosts Per Storage Port	Select to share storage ports with multiple hosts.
	Secondary Multiple Hosts Per Host Group	Select to share host groups with multiple hosts.
	Secondary Host Settings	Specify information about the hosts for which the volumes will be allocated.
	Host Name	Specify the host name.
	WWN Settings	Specify the WWN settings when using the Fibre port setting.
	WWN	Specify the World Wide Name (WWN).
	WWN Nickname	Specify the WWN nickname.

Navigation pane	Settings pane	Description
	Enable ALUA on Preferred Path	Enable ALUA on the preferred path.
	Enable Host Mode Option on Non-preferred Path	Enable the Host Mode option on the non-preferred path.
	iSCSI Settings	Specify the iSCSI settings when using the iSCSI port type.
	iSCSI Name	Specify the iSCSI name.
	iSCSI Nickname	Specify the iSCSI nickname.
Fabric Settings for Secondary Volumes	Use Fabric Settings	Specify True to enable fabric information collection.
	Connection Names	Specify the connection name defined in the Web Service Connections on the Administration tab. Separate multiple values by commas. If this value is omitted, the system uses all defined connections for the product name listed in the Web Service Connections.
	Resource Groups	Specify the switch management server resource group. Separate multiple values by commas.
	Target Fabrics	Specify the fabric name. Separate multiple values by commas. If this value is omitted, the system uses all the fabrics that the BNA monitors.
	Use Existing Zone	Specifies whether to select a predefined zone or any connectable path. If you specify True, the system selects paths within the range of the existing Zone setting. If you specify False, the system selects connectable paths regardless of the existing Zone setting.
	Number of Hops Restriction	Determines whether restrict path selection to within an assigned number of hops. When this property enabled, the service will fail if there is no path that matched the specified collection range.
	Maximum Number of Hops	When using the Number of Hops Restriction option, specify the collection range by the number of hops.

Navigation pane	Settings pane	Description
Zone Settings for Secondary Volumes	Update Zone Configurations	Specify True to enable zone setting modification.
	Use Existing Zone Aliases	Specify True to use predefined Zone Aliases regardless of the naming conventions the user specifies. If you specify False, the system selects Zone Aliases that follow the naming conventions. In either case, if there are no existing Zone Aliases, the system creates new Zone Aliases that follow the naming conventions.
	Update Current Active Zone Configuration	Specify True to add a Zone to the active Zone Configuration.
	Zone Configurations to Update	To add a zone to a Zone Configuration other than the active configuration, specify the name of the Zone Configuration in which to add the zone.
	Script for Zone Naming	Specify the naming convention script that determines the Zone name for the path.
	Script for Host Zone Alias Naming	Specify the naming convention script that determines the Zone Alias name for the host port.
	Script for Storage Zone Alias Naming	Specify the naming convention script that determines the Zone Alias name for the storage port.
Copy Pair Settings Note: The maximum number of copy pairs you can create is 99.	Target Copy Group	Specify whether to use an existing copy group or create a new one.
	Copy Group Name	Specify the name of the new copy group to create.
	Copy Pace	Specify the copy speed. The larger the value specified, the faster the copy speed will be.
	Use the nocopy option	Specify whether to perform an initial copy when creating a pair.
	Assign CTG	Specify whether to register the new pairs in a consistency group.
	CTG ID	Specify whether to select the consistency group ID automatically or manually.
	CTG ID - Manual Selection	Specify the consistency group ID by using a hexadecimal (base 16) number.

Navigation pane	Settings pane	Description
	MU Number	Specify whether to select the mirror unit (MU) automatically or manually.
	MU Number - Manual Selection	Specify the mirror unit (MU) mirror unit number by using a number from 0 to 3.
	Path Group ID	Specify whether to select the path group ID automatically or manually. If you specify "Auto Selection", 0 is automatically chosen.
	Path Group ID - Manual Selection	Specify the path group ID by using a hexadecimal (base 16) number in the range from 00 to FF.
	Reduction Force Copy	Specify whether to forcibly create a pair for the volume for which the capacity saving function (deduplication and compression) is enabled.
	Quorum Disk ID	Specify the Quorum disk ID.
	Copy Group	Specify the existing copy group.
<p>Note:</p> <ol style="list-style-type: none"> 1. If you select Automatic for Pool Selection in the Volume Settings panel of the Edit/Submit Service window, the largest free pool capacity will be selected after volume allocation. 		

ESX cluster service templates

The Ops Center Automator ESX cluster service templates are provided with the software and are preconfigured.

Allocate Fabric Aware Volumes and Create Datastore for ESX Cluster

Allocates volumes to VMware ESX cluster hosts, configures zoning, and creates a VMware datastore under a datastore cluster.

Add Host to Cluster in vCenter

Allocates existing volumes used as datastores by ESX cluster hosts to new ESX hosts.

Remove Host from Cluster in vCenter

Unmounts VMFS datastores, unallocates volumes from specified ESX hosts, and deletes zoning.

Supported platforms

For information on supported platforms, see [Service template supported platforms \(on page 146\)](#).

Default ports

The default ports and their uses are as follows:

Port number	Use
23450	Communication from Ops Center Automator to Ops Center API Configuration Manager.
23451	Secure communication from Ops Center Automator to Ops Center API Configuration Manager.

Installing Python and Python Library (Windows OS)

Procedure

1. Install Python 3.x on the same server as Ops Center Automator.
 - a. Download the Python installer from following site: <https://www.python.org/downloads/windows/>.
 - b. Go to the download location and run the installation.
The **Install Python** wizard opens.
 - c. For Python 3.10 or later:

Select both options: **Use admin privileges when installing py.exe** and **Add python.exe to PATH**.

For Python 3.9 or earlier:

Select both options: **Install launcher for all users** and **Add Python 3.x to PATH**.
 - d. Click **Install Now**.

You should not customize your installation, but if you do, you must ensure that you select the option to install pip from the Optional Features. The pip component is required to install the Python libraries.

2. Install **pyvmomi**, which is the Python library that enables Ops Center Automator to communicate with vCenter.
 - For an online environment, follow these steps:
 - From the command line, run the following command to download the library and install it into the Python environment: `pip install pyvmomi`.
 - Verify that the library is installed correctly by using the following command: `pip list pyvmomi`.
 - For more information go to <https://github.com/vmware/pyvmomi>.
 - For an offline environment, follow these steps:
 - Download the following seven libraries in an online environment:
 - six (<https://pypi.org/project/six/>)
 - urllib3 (<https://pypi.org/project/urllib3/>)
 - certifi (<https://pypi.org/project/certifi/>)
 - idna (<https://pypi.org/project/idna/>)
 - charset-normalizer (<https://pypi.org/project/charset-normalizer/>)
 - requests (<https://pypi.org/project/requests/>)
 - pyvmomi (<https://pypi.org/project/pyvmomi/>)
 - For each library, decompress the downloaded file and run following command: `python setup.py install`.

For more detailed information about installing the Python library, go to <https://github.com/vmware/pyvmomi>.

Result

Python and the Python Library are now installed on Ops Center Automator.

Installing Python and Python Library (Linux OS)

Procedure

1. Install Python on the same server as Ops Center Automator.
 - Download the gzipped source file from the following site: <https://www.python.org/downloads/source/>.
 - Decompress the gzipped source file and run following commands:
 - `./configure`
 - `make`
 - `sudo make install`
 - In the **Administration** tab of Ops Center Automator, use the **Shared Properties Settings** to configure the python install path to the shared property of the **Python Interpreter Path**.

2. Install **pyvmomi** (Python library for Ops Center Automator to talk with vCenter).
 - For an online environment, follow these steps:
 - Run the following command on the command line to download the library and install it into the Python environment: `pip install pyvmomi`.
 - Verify that the library is installed correctly by using the following command: `pip list pyvmomi`.
 - For more information go to <https://github.com/vmware/pyvmomi>.
 - For an offline environment, follow these steps:
 - Download the following seven libraries in an online environment:
 - six (<https://pypi.org/project/six/>)
 - urllib3 (<https://pypi.org/project/urllib3/>)
 - certifi (<https://pypi.org/project/certifi/>)
 - idna (<https://pypi.org/project/idna/>)
 - charset-normalizer (<https://pypi.org/project/charset-normalizer/>)
 - requests (<https://pypi.org/project/requests/>)
 - pyvmomi (<https://pypi.org/project/pyvmomi/>)
 - For each library, decompress the downloaded file and run following command:
`python setup.py install`.

Result

Python and the Python Library are now installed on Ops Center Automator.

Allocate Fabric Aware Volumes and Create Datastore for ESX Cluster: Service details

The Allocate Fabric Aware Volumes and Create Datastore for ESX Cluster service template enables you to allocate volumes to VMware ESX cluster hosts, configure zoning, and create a VMware datastore under a datastore cluster.

The following service template details apply to the Allocate Fabric Aware Volumes and Create Datastore for ESX Cluster service template.

Software and setup prerequisites

For software and setup prerequisites, see [Service template prerequisites \(on page 126\)](#).

Edit Service settings

The following table lists the Edit Service settings for the Allocate Fabric Aware Volumes and Create Datastore for ESX Cluster service template.

Navigation pane	Settings pane	Description
Target ESX Cluster	vCenter Connection	Specify a vCenter Server that is registered as a Web Service Connection in the Administration Tab.
	ESX Cluster	Specify the ESX Cluster name.
	Perform LIP Reset	Perform LIP reset on the ESX host. If you enable LIP Reset, you must also register agentless remote connection settings for each ESX Server.
	ESX Prompt Pattern	Specifies the command prompt pattern to use when running <code>esxccli</code> on the ESX server. You do not need to specify this if "Perform LIP Reset" is disabled.
Target Storage	Configuration Manager Connection	Select the Configuration Manager server which is registered as a Web Service Connection in the Administration Tab.
	Storage System	Select a storage system.
	Resource Group	Specify the resource group from which resources are used (for example LDEV ID and host group ID). You must specify the resource group for VSM when allocating volumes in VSM.
	Virtual Model	Select the Virtual Model associated with VSM. This is needed when allocating volumes to VSM. This field is inactive when the Virtual Storage System ID is 0 in the Resource Group.

Navigation pane	Settings pane	Description
	Virtual Serial Number	Specify the Virtual Serial Number associated with VSM when allocating volumes in VSM.
	Port Selection	<p>Select the storage port selection criteria:</p> <ul style="list-style-type: none"> ▪ "Smaller number of hosts": Select the port with the smallest registered WWN. (Default value) ▪ "Smaller number of volumes": Select the port with the smallest registered LUN.
Resource Criteria	Storage Port	Specify the Storage Port Configuration Expressions (Name and Value) that meets the specified criteria (Equals, Not Equals, Starts with, and Ends with) based on the selected condition (All or Any).
Volume Settings	Number of Volumes	Specify the number of volumes to create.
	LDEV ID Starts From	Specify the starting LDEV ID as a hexadecimal number for the volume to allocate.
	Volume Capacity	Specify the volume capacity.
	Pool	Shows a table from which you can choose the pool.
	Volume Label	Specify the volume label.
	LUN Starts From	Specify the starting logical unit number assigned to the volume for a host.
	Virtual LDEV ID Starts From	Specify the starting Virtual LDEV ID as a hexadecimal number for the volume to allocate.

Navigation pane	Settings pane	Description
Host Group Settings	Script for Host Group Naming	Specify a naming rule for the Host Group name as a script.
	Host Mode	Specify the host mode.
	Host Mode Options	Specify the host mode options.
Fabric Settings	Use Fabric Settings	Determines whether to use fabric information from the FC switch manager services for LUN path selection.
	Connections	Specify the connection for the FOS_PrimarySwitch defined in the Web Service Connections on the Administration tab. If this value is omitted, the system uses all connections that are defined for the product name listed in the Web Service Connections.
	Target Fabrics	Specify the fabric name. Separate multiple values by commas. If omitted, all fabrics defined as the FOS_PrimarySwitch specified in Connections will be used.
	Use Existing Zone	Specify whether to select a predefined zone or any connectable path. If you specify True, the system selects paths within the range of the existing Zone setting. If you specify False, the system selects connectable paths regardless of the existing Zone setting.

Navigation pane	Settings pane	Description
	Use Active Zone Only	Specify whether to use the active zone only if Use Existing Zone is true. Specifying True selects paths with an active Zone setting only. Specifying False selects connectable paths including those with an inactive Zone setting.
	Num. of Hops Restriction	Determines whether restrict path selection to within an assigned number of hops. When this property enabled, the service will fail if there is no path that matched the specified collection range.
	Maximum Num. of Hops	Specify the maximum number of hops when "Num. of Hops Restriction" is set to True.
Zone Settings	Update Zone Configurations	Specify whether to add or create zones.
	Use Existing Zone Aliases	Specify whether to update existing zone alias.
	Update Current Active Zone Configuration	Determines whether to use Zone Active configuration when adding or creating a zone.
	Zone Configurations to Update	Specify a range of zones in which zones are created when "Update Current Active Zone Config" is False.
	Interval for each Fabric Settings	Specify the wait time in minutes between configuring fabrics.
	Script for Zone Naming	Enables zone naming using JavaScript.
	Script for Host Zone Alias Naming	Enables naming of the Host Zone Alias for host WWNs using JavaScript.

Navigation pane	Settings pane	Description
	Script for Storage Zone Alias Naming	Enables naming of the Storage Zone Alias for storage ports using JavaScript.
Datastore Settings	Datastore Cluster Name	Select a Datastore Cluster name.
	Datastore Name Prefix	Specify the prefix of the Datastore name. A 4-digit sequential number is automatically added after the prefix.
	VMFS Version	Specify the VMFS version of the Datastore.
	Block Size	Specify the block size of the Datastore.
	Storage I/O Control	Specify whether to enable storage I/O control of the Datastore.
	Threshold Type	Specify the type of threshold, either "Latency Threshold" or "Throughput Threshold".
	Threshold Value	Specify the value of the threshold.
Notification Settings	To Addresses	Specify the To email addresses. Use a comma to separate multiple addresses.
	Cc Addresses	Specify the Cc email addresses. Use a comma to separate multiple addresses.
	Subject	Specify the email subject.
	Body	Specify the email body.

Navigation pane	Settings pane	Description
	Response Input Dialog Box	Specify HTML or text in the Response Entry dialog box. To change a service property value in the Response Entry dialog box, specify the property key for the "name" attribute of an input tag (<input>) or a select tag (<select>).

Submit Service Request settings

The following table lists the Submit Service Request settings for the Allocate Fabric Aware Volumes and Create Datastore for ESX Cluster service template.

Navigation pane	Settings pane	Description
Target ESX Cluster	vCenter Connection	Specify a vCenter Server that is registered as a Web Service Connection in the Administration Tab.
	ESX Cluster	Specify the ESX Cluster name.
Target Storage	Configuration Manager Connection	Select the Configuration Manager server which is registered as a Web Service Connection in the Administration Tab.
	Storage System	Select a storage system.
	Resource Group	Specify the resource group from which resources are used (for example LDEV ID and host group ID). You must specify the resource group for VSM when allocating volumes in VSM.

Navigation pane	Settings pane	Description
	Virtual Model	Select the Virtual Model associated with VSM. This is needed when allocating volumes to VSM. This field is inactive when the Virtual Storage System ID is 0 in the Resource Group.
	Virtual Serial Number	Specify the Virtual Serial Number associated with VSM when allocating volumes in VSM.
	Port Selection	Select the storage port selection criteria: <ul style="list-style-type: none"> ▪ "Smaller number of hosts": Select the port with the smallest registered WWN. (Default value) ▪ "Smaller number of volumes": Select the port with the smallest registered LUN.
Resource Criteria	Storage Port	Specify the Storage Port Configuration Expressions (Name and Value) that meets the specified criteria (Equals, Not Equals, Starts with, and Ends with) based on the selected condition (All or Any).
Volume Settings	Number of Volumes	Specify the number of volumes to create.
	LDEV ID Starts From	Specify the starting LDEV ID as a hexadecimal number for the volume to allocate.
	Volume Capacity	Specify the volume capacity.
	Pool	Shows a table from which you can choose the pool.
	Volume Label	Specify the volume label.

Navigation pane	Settings pane	Description
	LUN Starts From	Specify the starting logical unit number assigned to the volume for a host.
	Virtual LDEV ID Starts From	Specify the starting Virtual LDEV ID as a hexadecimal number for the volume to allocate.
Host Group Settings	Script for Host Group Naming	Specify a naming rule for the Host Group name as a script.
	Host Mode	Specify the host mode.
	Host Mode Options	Specify the host mode options.
Fabric Settings	Connections	Specify the connection for the FOS_PrimarySwitch defined in the Web Service Connections on the Administration tab. If this value is omitted, the system uses all connections that are defined for the product name listed in the Web Service Connections.
	Target Fabrics	Specify the fabric name. Separate multiple values by commas. If omitted, all fabrics defined as the FOS_PrimarySwitch specified in Connections will be used.
	Use Existing Zone	Specify whether to select a predefined zone or any connectable path. If you specify True, the system selects paths within the range of the existing Zone setting. If you specify False, the system selects connectable paths regardless of the existing Zone setting.

Navigation pane	Settings pane	Description
	Use Active Zone Only	Specify whether to use the active zone only if Use Existing Zone is true. Specifying True selects paths with an active Zone setting only. Specifying False selects connectable paths including those with an inactive Zone setting.
	Num. of Hops Restriction	Determines whether restrict path selection to within an assigned number of hops. When this property enabled, the service will fail if there is no path that matched the specified collection range.
	Connections	Specify the connection for the FOS_PrimarySwitch defined in the Web Service Connections on the Administration tab. If this value is omitted, the system uses all connections that are defined for the product name listed in the Web Service Connections.
	Maximum Num. of Hops	Specify the maximum number of hops when "Num. of Hops Restriction" is set to True.
Zone Settings	Update Zone Configurations	Specify whether to add or create zones.
	Use Existing Zone Aliases	Specify whether to update existing zone alias.
	Update Current Active Zone Configuration	Determines whether to use Zone Active configuration when adding or creating a zone.
	Zone Configurations to Update	Specify a range of zones in which zones are created when "Update Current Active Zone Config" is False.

Navigation pane	Settings pane	Description
	Interval for each Fabric Settings	Specify the wait time in minutes between configuring fabrics.
	Script for Zone Naming	Enables zone naming using JavaScript.
	Script for Host Zone Alias Naming	Enables naming of the Host Zone Alias for host WWNs using JavaScript.
	Script for Storage Zone Alias Naming	Enables naming of the Storage Zone Alias for storage ports using JavaScript.
Datastore Settings	Datastore Cluster Name	Select a Datastore Cluster name.
	Datastore Name Prefix	Specify the prefix of the Datastore name. A 4-digit sequential number is automatically added after the prefix.
	VMFS Version	Specify the VMFS version of the Datastore.
	Block Size	Specify the block size of the Datastore.
	Storage I/O Control	Specify whether to enable storage I/O control of the Datastore.
	Threshold Type	Specify the type of threshold, either "Latency Threshold" or "Throughput Threshold".
	Threshold Value	Specify the value of the threshold.
Notification Settings	To Addresses	Specify the To email addresses. Use a comma to separate multiple addresses.
	Cc Addresses	Specify the Cc email addresses. Use a comma to separate multiple addresses.
	Subject	Specify the email subject.

Navigation pane	Settings pane	Description
	Body	Specify the email body.
	Response Input Dialog Box	Specify HTML or text in the Response Entry dialog box. To change a service property value in the Response Entry dialog box, specify the property key for the "name" attribute of an input tag (<input>) or a select tag (<select>).

Zone naming conventions

The following table lists the zone naming conventions for use with the Allocate Fabric Aware Volumes and Create Datastore for ESX Cluster service template.

Type	Zone name	Zone alias name (Host side/ Storage side)
Input	One object has the following properties: <ul style="list-style-type: none"> hostName: Host name hostPortWorldWideName: WWN of HBA. Separator notation is based on FC switch manager services. storagePortWorldWideName: WWN of CHA. Separator notation is based on FC switch manager services. storageSystemSerialNumber: Serial number of physical storage system storagePortName: Display port name of the storage system serviceProperties: List of the service properties passed to the plug-in 	
Output	Zone name to add to the specified Zone Configuration.	Zone alias name to add to the zone specified in the Zone name convention.
Handling when the output is the same name	Same zone name of the same fabric refers to the same zone. In the case of an existing zone: Add an alias in the zone and add to the Zone Configuration. null: Do not create a zone.	Same zone alias name of the same fabric refers to the same alias. In the case of an existing alias: Add WWN in the alias and add to the Zone. null: Do not create an alias.

Type	Zone name	Zone alias name (Host side/ Storage side)
Handling when unavailable characters are used for output	Characters other than alphanumeric characters and "_" are converted to "_" and become part of the name.	
If the output string is too long	When the output string is over 60 characters, the 61st and subsequent characters are truncated.	When the output string is over 64 characters or more, the 65th and subsequent characters are truncated.
Validation	An error occurs if the return value is one of following: <ul style="list-style-type: none"> Other than String When starting from non-alphabetic characters. When having a non-standard prefix for the zone. ("LSAN_", "TL_", "QOS[HML] [0-9]+_")(case ignored) 	An error occurs if the return value is one of following: <ul style="list-style-type: none"> Other than String When starting from non-alphabetic characters.

Add Host to Cluster in vCenter: Service details

The Add Host to Cluster in vCenter service template enables you to allocate existing volumes used as datastores by ESX cluster hosts to a new ESX host.

The following service template details apply to the Add Host to Cluster in vCenter service template.

Software and setup prerequisites

For software and setup prerequisites, see [Service template prerequisites \(on page 126\)](#).

Edit Service settings

The following table lists the Edit Service settings for the Add Host to Cluster in vCenter service template.

Navigation pane	Settings pane	Description
Target ESX Cluster	vCenter Connection	Specify a vCenter Server that is registered as a Web Service Connection in the Administration Tab.

Navigation pane	Settings pane	Description
	ESX Cluster	Specify the ESX Cluster name.
	ESX Hosts	Specify ESX host names.
Target Storage	Configuration Manager Connection	Select the Configuration Manager server which is registered as a Web Service Connection in the Administration Tab.
	Storage System	Select a storage system.
	Resource Group	Specify the resource group from which resources are used (for example LDEV ID and host group ID). You must specify the resource group for VSM when allocating volumes in VSM.
	Port Selection	<p>Select the storage port selection criteria:</p> <ul style="list-style-type: none"> ▪ "Smaller number of hosts": Select the port with the smallest registered WWN. (Default value) ▪ "Smaller number of volumes": Select the port with the smallest registered LUN.
Resource Criteria	Storage Port	Specify the Storage Port Configuration Expressions (Name and Value) that meets the specified criteria (Equals, Not Equals, Starts with, and Ends with) based on the selected condition (All or Any).
Host Group Settings	Script for Host Group Naming	Specify a naming rule for the Host Group name as a script.
	Host Mode	Specify the host mode.

Navigation pane	Settings pane	Description
	Host Mode Options	Specify the host mode options.
Fabric Settings	Use Fabric Settings	Determines whether to use fabric information from the FC switch manager services for LUN path selection.
	Connections	Specify the connection for the FOS_PrimarySwitch defined in the Web Service Connections on the Administration tab. If this value is omitted, the system uses all connections that are defined for the product name listed in the Web Service Connections.
	Target Fabrics	Specify the fabric name. Separate multiple values by commas. If omitted, all fabrics defined as the FOS_PrimarySwitch specified in Connections will be used.
	Use Existing Zone	Specify whether to select a predefined zone or any connectable path. If you specify True, the system selects paths within the range of the existing Zone setting. If you specify False, the system selects connectable paths regardless of the existing Zone setting.
	Use Active Zone Only	Specify whether to use the active zone only if Use Existing Zone is true. Specifying True selects paths with an active Zone setting only. Specifying False selects connectable paths including those with an inactive Zone setting.

Navigation pane	Settings pane	Description
	Num. of Hops Restriction	Determines whether restrict path selection to within an assigned number of hops. When this property enabled, the service will fail if there is no path that matched the specified collection range.
	Maximum Num. of Hops	Specify the maximum number of hops when "Num. of Hops Restriction" is set to True.
Zone Settings	Update Zone Configurations	Specify whether to add or create zones.
	Use Existing Zone Aliases	Specify whether to update existing zone alias.
	Update Current Active Zone Configuration	Determines whether to use Zone Active configuration when adding or creating a zone.
	Zone Configurations to Update	Specify a range of zones in which zones are created when "Update Current Active Zone Config" is False.
	Interval for each Fabric Settings	Specify the wait time in minutes between configuring fabrics.
	Script for Zone Naming	Enables zone naming using JavaScript.
	Script for Host Zone Alias Naming	Enables naming of the Host Zone Alias for host WWNs using JavaScript.
	Script for Storage Zone Alias Naming	Enables naming of the Storage Zone Alias for storage ports using JavaScript.

Submit Service Request settings

The following table lists the Submit Service Request settings for the Add Host to Cluster in vCenter service template.

Navigation pane	Settings pane	Description
Target ESX Cluster	vCenter Connection	Specify a vCenter Server that is registered as a Web Service Connection in the Administration Tab.
	ESX Cluster	Specify the ESX Cluster name.
	ESX Hosts	Specify ESX host names.
Target Storage	Configuration Manager Connection	Select the Configuration Manager server which is registered as a Web Service Connection in the Administration Tab.
	Storage System	Select a storage system.
	Resource Group	Specify the resource group from which resources are used (for example LDEV ID and host group ID). You must specify the resource group for VSM when allocating volumes in VSM.
	Port Selection	<p>Select the storage port selection criteria:</p> <ul style="list-style-type: none"> ▪ "Smaller number of hosts": Select the port with the smallest registered WWN. (Default value) ▪ "Smaller number of volumes": Select the port with the smallest registered LUN.
Resource Criteria	Storage Port	Specify the Storage Port Configuration Expressions (Name and Value) that meets the specified criteria (Equals, Not Equals, Starts with, and Ends with) based on the selected condition (All or Any).

Navigation pane	Settings pane	Description
Host Group Settings	Script for Host Group Naming	Specify a naming rule for the Host Group name as a script.
	Host Mode	Specify the host mode.
	Host Mode Options	Specify the host mode options.
Fabric Settings	Connections	Specify the connection for the FOS_PrimarySwitch defined in the Web Service Connections on the Administration tab. If this value is omitted, the system uses all connections that are defined for the product name listed in the Web Service Connections.
	Target Fabrics	Specify the fabric name. Separate multiple values by commas. If omitted, all fabrics defined as the FOS_PrimarySwitch specified in Connections will be used.
	Use Existing Zone	Specify whether to select a predefined zone or any connectable path. If you specify True, the system selects paths within the range of the existing Zone setting. If you specify False, the system selects connectable paths regardless of the existing Zone setting.
	Use Active Zone Only	Specify whether to use the active zone only if Use Existing Zone is true. Specifying True selects paths with an active Zone setting only. Specifying False selects connectable paths including those with an inactive Zone setting.

Navigation pane	Settings pane	Description
	Num. of Hops Restriction	Determines whether restrict path selection to within an assigned number of hops. When this property enabled, the service will fail if there is no path that matched the specified collection range.
	Maximum Num. of Hops	Specify the maximum number of hops when "Num. of Hops Restriction" is set to True.
Zone Settings	Update Zone Configurations	Specify whether to add or create zones.
	Use Existing Zone Aliases	Specify whether to update existing zone alias.
	Update Current Active Zone Configuration	Determines whether to use Zone Active configuration when adding or creating a zone.
	Zone Configurations to Update	Specify a range of zones in which zones are created when "Update Current Active Zone Config" is False.
	Interval for each Fabric Settings	Specify the wait time in minutes between configuring fabrics.
	Script for Zone Naming	Enables zone naming using JavaScript.
	Script for Host Zone Alias Naming	Enables naming of the Host Zone Alias for host WWNs using JavaScript.
	Script for Storage Zone Alias Naming	Enables naming of the Storage Zone Alias for storage ports using JavaScript.

Zone naming conventions

The following table lists the zone naming conventions for use with the Add Host to Cluster in vCenter service template.

Type	Zone name	Zone alias name (Host side/ Storage side)
Input	<p>One object has the following properties:</p> <ul style="list-style-type: none"> hostName: Host name hostPortWorldWideName: WWN of HBA. Separator notation is based on FC switch manager services. storagePortWorldWideName: WWN of CHA. Separator notation is based on FC switch manager services. storageSystemSerialNumber: Serial number of physical storage system storagePortName: Display port name of the storage system serviceProperties: List of the service properties passed to the plug-in 	
Output	Zone name to add to the specified Zone Configuration.	Zone alias name to add to the zone specified in the Zone name convention.
Handling when the output is the same name	<p>Same zone name of the same fabric refers to the same zone.</p> <p>In the case of an existing zone: Add an alias in the zone and add to the Zone Configuration.</p> <p>null: Do not create a zone.</p>	<p>Same zone alias name of the same fabric refers to the same alias.</p> <p>In the case of an existing alias: Add WWN in the alias and add to the Zone.</p> <p>null: Do not create an alias.</p>
Handling when unavailable characters are used for output	<p>Characters other than alphanumeric characters and "_" are converted to "_" and become part of the name.</p>	
If the output string is too long	When the output string is over 60 characters, the 61st and subsequent characters are truncated.	When the output string is over 64 characters or more, the 65th and subsequent characters are truncated.

Type	Zone name	Zone alias name (Host side/ Storage side)
Validation	<p>An error occurs if the return value is one of following:</p> <ul style="list-style-type: none"> Other than String When starting from non-alphabetic characters. When having a non-standard prefix for the zone. ("LSAN_", "TI_", "QOS[HML] [0-9]+_")(case ignored) 	<p>An error occurs if the return value is one of following:</p> <ul style="list-style-type: none"> Other than String When starting from non-alphabetic characters.

Remove Host from Cluster in vCenter: Service details

The Remove Host from Cluster in vCenter service template enables you to unmount VMFS datastores, unallocate volumes from the specified ESX host, and delete zoning.

The following service template details apply to the Remove Host from Cluster in vCenter service template.

Software and setup prerequisites

For software and setup prerequisites, see [Service template prerequisites \(on page 126\)](#).

Edit Service settings

The following table lists the Edit Service settings for the Remove Host from Cluster in vCenter service template.

Navigation pane	Settings pane	Description
Target ESX Host	vCenter Connection	Specify a vCenter Server that is registered as a Web Service Connection in the Administration Tab.
	ESX Cluster	Specify the ESX Cluster name.
	ESX Host	Specify the ESX host name.

Navigation pane	Settings pane	Description
	Enter Maintenance Mode	Select this option to enter Maintenance Mode. Note: Virtual machines running on a host entering maintenance mode must be migrated to another host (either manually or automatically by DRS) or shut down. The host is in a state of "Entering Maintenance Mode" until all running virtual machines are powered down or migrated to different hosts.
	Timeout	Specify how long (in seconds) the service waits before timing out. In the event of a response timeout, the service ends abnormally.
	Evacuate Powered Off VMs	Select this option to move powered-off or suspended virtual machines to another ESX host when the ESX host enters Maintenance Mode. You must select this option to continue to use these virtual machines after removing the ESX host. If you do not select this option, powered-off and suspended virtual machines are not moved to other ESX hosts.
	Unmount Datastore	Select this option to unmount the datastore from the ESX host before migrating or shutting down the storage volume.
Unallocate Settings	Delete Host Group	Select this option to delete the host group.
Remove Zoning Settings	Remove Zoning	Select this option to remove zoning settings. By default, this check box is not selected. (false)

Submit Service Request settings

The following table lists the Submit Service Request settings for the Remove Host from Cluster in vCenter service template.

Navigation pane	Settings pane	Description
Target ESX Host	vCenter Connection	Specify a vCenter Server that is registered as a Web Service Connection in the Administration Tab.
	ESX Cluster	Specify the ESX Cluster name.
	ESX Host	Specify ESX host name.
	Enter Maintenance Mode	Select this option to enter Maintenance Mode. Note: Virtual machines running on a host entering maintenance mode must be migrated to another host (either manually or automatically by DRS) or shut down. The host is in a state of "Entering Maintenance Mode" until all running virtual machines are powered down or migrated to different hosts.
	Timeout	Specify how long (in seconds) the service waits before timing out. In the event of a response timeout, the service ends abnormally.
	Evacuate Powered Off VMs	Select this option to move powered-off or suspended virtual machines to another ESX host when the ESX host enters Maintenance Mode. You must select this option to continue to use these virtual machines after removing the ESX host. If you do not select this option, powered-off and suspended virtual machines are not moved to other ESX hosts.

Navigation pane	Settings pane	Description
	Unmount Datastore	Select this option to unmount the datastore from the ESX host before migrating or shutting down the storage volume.
Unallocate Settings	Delete Host Group	Select this option to delete the host group.
Remove Zoning Settings	Remove Zoning	Select this option to remove zoning settings. By default, this check box is not selected. (false)

ESXi host service templates

The Allocate Volumes, Fabric, and Datastore for ESXi Host service template is provided with the software and are preconfigured.

Supported platforms

For information on supported platforms, see [Service template supported platforms \(on page 146\)](#).

Default ports

The port numbers and their uses are as follows:

Port number	Use
22015	Communication from Ops Center Automator client to Ops Center Automator server.
22016	Secure communication from Ops Center Automator client to Ops Center Automator server.
23450	Communication from Ops Center Automator to Ops Center API Configuration Manager.
23451	Secure communication from Ops Center Automator to Ops Center API Configuration Manager.

Allocate Volumes, Fabric, and Datastore for ESXi Host: Service details

This service template allocates volumes to the VMware vSphere server (ESXi host), configures zoning, and creates VMware datastores.

When using this service template, be aware that you cannot specify "SSD(QLC)" for "Disk Type" in the Edit/Submit Service window. If you do not specify any "Disk Type" value, pools with all the disk type including SSD(QLC) become candidate pools. If you want to use an SSD(QLC) drive, identify a pool with SSD(QLC) by another tool (such as VSP One Block Administrator) and specify the pool for "Pool" in the Edit/Submit Service window.

Software and setup prerequisites

For software and setup prerequisites, see [Service template prerequisites \(on page 126\)](#).

Edit Service Settings

The following table lists the Edit Service settings for the Allocate Volumes, Fabric, and Datastore for ESXi Host service template.

Navigation pane	Settings pane	Description
Volume Settings	Configuration Manager Connection	Specify the Configuration Manager Connection.
	Storage System Selection	Specify whether to select storage system at volume allocation. If you select Automatic, then a storage system will be selected automatically.
	Storage System	Specify the storage system.
	Resource Group Selection	Specify whether to select a resource group at volume allocation. If you select Meta resource, then the meta resource group will be selected.
	Resource Group	Specify the Resource Group.
	Pool Selection*	Specify whether to select a pool at volume allocation. If you select Automatic, then a pool will be selected automatically.
	Pool	Specify the pool.
	Capacity Format	Select the volume capacity format.
	Volume Settings	Specify the parameters for creating new volumes.
	Volume Usage	

Navigation pane	Settings pane	Description
	Number of Volumes	Specify the number of volumes.
	Volume Capacity	Specify the volume capacity in bytes.
	Volume Capacity	Specify the volume capacity in blocks. (1 block = 512 bytes)
	Volume Label	Specify the volume label.
	Disk Type	Specify the disk type of the pool to use. You cannot specify "SSD(QLC)".
	LDEV Setting	
	LDEV ID Starts From	Specify the startup LDEV ID as a hexadecimal number for the volume to allocate.
	Virtual LDEV ID Starts From	Specify the startup Virtual LDEV ID for the volume to allocate.
	LUN Setting	
	LUN Starts From	Specify the starting logical unit number assigned to the volume for a host.
Resource Criteria	Resource Criteria	Specify the Storage Port Configuration Expressions (Name and Value) that meets the specified criteria (Equals, Not Equals, Starts with, and Ends with) based on the selected condition (All or Any).
	Volume Usage	Select the volumes usage.
Host Settings	vCenter Connection	Specify the vCenter connection.
	ESXi Host	Specify the ESXi Host.

Navigation pane	Settings pane	Description
	Perform LIP Reset	Select true to perform LIP reset on the ESXi host when the created volumes are not visible on the ESXi host. Note: If the ESXi host has specific paths, the specific paths might also reset. If you enable LIP Reset, you must also register agentless remote connection settings for each ESXi server.
	Host Mode/Host Mode Options	Specify the parameters for creating a new host group.
	Host Mode	Specify the host mode.
	Host Mode Options	Specify the host mode options.
Fabric Settings	Use Fabric Settings	Select this option to enable fabric information collection.
	Fabric Connection Type	This property defines connection type information.
	Connections	Specify the connection defined in the Web Service Connections on the Administration tab. If this value is omitted, the system uses all connections that are defined for the product name listed in the Web Service Connections.
	Target Fabrics	Specify the fabric name. Separate multiple values by commas. If omitted, all fabrics defined as the FOS_PrimarySwitch/DCNM specified in Connections will be used.

Navigation pane	Settings pane	Description
	Use Existing Zone	Specifies whether to select a predefined zone or any connectable path. If you select this option, the system selects paths within the range of the existing Zone setting. If you do not select this option, the system selects connectable paths regardless of the existing Zone setting.
	Number of Hops Restriction	Determines whether restrict path selection to within an assigned number of hops. When this property enabled, the service will fail if there is no path that matched the specified collection range.
	Maximum Number of Hops	When using the Number of Hops Restriction option, specify the collection range by the number of hops.
Zone Settings	Update Zone Configurations	Select this option to enable the modification of zone settings.
	Use Existing Zone Aliases	Select this option to use predefined Zone Aliases regardless of the naming conventions the user specifies. If you do not select this option, the system selects Zone Aliases that follow the naming conventions. In either case, if there are no existing Zone Aliases, the system creates new Zone Aliases that follow the naming conventions.
	Update Current Active Zone Configuration	Select this option to add a Zone to the active Zone Configuration.

Navigation pane	Settings pane	Description
	Zone Configurations to Update	To add a zone to a Zone Configuration other than the active configuration, specify the name of the Zone Configuration in which to add the zone.
	Script for Zone Naming	Specify the naming convention script that determines the Zone name for the path.
	Script for Host Zone Alias Naming	Specify the naming convention script that determines the Zone Alias name for the host port.
	Script for Storage Zone Alias Naming	Specify the naming convention script that determines the Zone Alias name for the storage port.
Datastore Settings	Datastore Cluster	Specify the datastore cluster to which to add the datastores you are creating.
	Datastore Name Prefix	Specify the prefix of the datastore. A 4-digit sequential number is automatically added after the prefix.
	VMFS Version	Specify the VMFS version for the datastore.
	Block Size	Specify the block size for the datastore.
	Storage I/O Control	Select this option to enable storage I/O control for the datastore.
	Threshold Type	Specify the type of threshold, either "Latency Threshold" or "Throughput Threshold".
	Threshold Value	Specify the value of the latency threshold if storage I/O control is enabled.

Navigation pane	Settings pane	Description
Notification Settings	To Addresses	Specify the To email addresses. Use a comma to separate multiple addresses.
	Cc Addresses	Specify the Cc email addresses. Use a comma to separate multiple addresses.
	Bcc Addresses	Specify the Bcc email addresses. Use a comma to separate multiple addresses.
	Encoding	Specify us-ascii, iso-2022-jp, shift_jis, euc-jp, or utf-8 for the email encoding.
	Subject	Specify the email subject.
	Body	Specify the email body.
	Response Input Dialog Box	Specify HTML or text in the Response Entry dialog box. To change a service property value in the Response Entry dialog box, specify the property key for the "name" attribute of an input tag (<input>) or a select tag (<select>).
	Response Timeout	Specify a timeout (in minutes) for the Response Entry dialog box. The range is between 1 and 20,160 minutes.
	<p>Notes:</p> <p>* If you select Automatic for Pool Selection in the Volume Settings panel of the Edit/Submit Service window, the pool is automatically selected using the following criteria:</p> <ol style="list-style-type: none"> 1. Select the pool with the largest free pool capacity after volume allocation. 2. If the free pool capacity is the same, select the pool on the storage system with the higher priority in the following table. 3. If no storage port is found where an LU path with the selected storage system and pool combination can be created, go back to 1 and select the next candidate pool. 	

Navigation pane		Settings pane	Description
Priority	Storage model		
1	VSP 5200, 5600, 5200H, 5600H		
2	VSP 5100, 5500, 5100H, 5500H		
3	VSP F1500, VSP G1500, VSP G1000		
4	VSP One B28		
5	VSP One B26		
6	VSP One B24		
7	VSP E1090, VSP E1090H		
8	VSP E990		
9	VSP E790, VSP E790H		
10	VSP E590, VSP E590H		
11	VSP F900, VSP G900		
12	VSP F700, VSP G700		
13	VSP F370, VSP G370		
14	VSP F350, VSP G350		
15	VSP F800, VSP G800, VSP N800		
16	VSP F400, VSP F600, VSP G400, VSP G600, VSP N400, VSP N600		
17	VSP G200		

Submit Service Request settings

The following table lists the Submit Service Request settings for the Allocate Volumes, Fabric, and Datastore for ESXi Host service template.

Navigation pane	Settings pane	Description
Volume Settings	Configuration Manager Connection	Specify the Configuration Manager Connection.

Navigation pane	Settings pane	Description
	Storage System Selection	Specify whether to select storage system at volume allocation. If you select Automatic, then a storage system will be selected automatically.
	Storage System	Specify the storage system.
	Resource Group Selection	Specify whether to select a resource group at volume allocation. If you select Meta resource, then the meta resource group will be selected.
	Resource Group	Specify the Resource Group.
	Pool Selection*	Specify whether to select a pool at volume allocation. If you select Automatic, then a pool will be selected automatically.
	Pool	Specify the pool.
	Capacity Format	Select the volume capacity format.
	Volume Settings	Specify the parameters for creating new volumes.
	Volume Usage	
	Number of Volumes	Specify the number of volumes.
	Volume Capacity	Specify the volume capacity in bytes.
	Volume Capacity	Specify the volume capacity in blocks. (1 block = 512 bytes)
	Volume Label	Specify the volume label.
	Disk Type	Specify the disk type of the pool to use. You cannot specify "SSD(QLC)".
	LDEV Setting	

Navigation pane	Settings pane	Description
	LDEV ID Starts From	Specify the startup LDEV ID as a hexadecimal number for the volume to allocate.
	Virtual LDEV ID Starts From	Specify the startup Virtual LDEV ID for the volume to allocate.
	LUN Setting	
	LUN Starts From	Specify the starting logical unit number assigned to the volume for a host.
Resource Criteria	Resource Criteria	Specify the Storage Port Configuration Expressions (Name and Value) that meets the specified criteria (Equals, Not Equals, Starts with, and Ends with) based on the selected condition (All or Any).
	Volume Usage	Select the volumes usage.
Host Settings	vCenter Connection	Specify the vCenter connection.
	ESXi Host	Specify the ESXi Host.
	Perform LIP Reset	Select true to perform LIP reset on the ESXi host when the created volumes are not visible on the ESXi host. Note: If the ESXi host has specific paths, the specific paths might also reset. If you enable LIP Reset, you must also register agentless remote connection settings for each ESXi server.
	Host Mode/Host Mode Options	Specify the parameters for creating a new host group.
	Host Mode	Specify the host mode.
	Host Mode Options	Specify the host mode options.

Navigation pane	Settings pane	Description
Fabric Settings	Use Fabric Settings	Select this option to enable fabric information collection.
	Fabric Connection Type	This property defines connection type information.
	Connections	Specify the connection defined in the Web Service Connections on the Administration tab. If this value is omitted, the system uses all connections that are defined for the product name listed in the Web Service Connections.
	Target Fabrics	Specify the fabric name. Separate multiple values by commas. If omitted, all fabrics defined as the FOS_PrimarySwitch/DCNM specified in Connections will be used.
	Use Existing Zone	Specifies whether to select a predefined zone or any connectable path. If you select this option, the system selects paths within the range of the existing Zone setting. If you do not select this option, the system selects connectable paths regardless of the existing Zone setting.
	Number of Hops Restriction	Determines whether restrict path selection to within an assigned number of hops. When this property enabled, the service will fail if there is no path that matched the specified collection range.
	Maximum Number of Hops	When using the Number of Hops Restriction option, specify the collection range by the number of hops.

Navigation pane	Settings pane	Description
Zone Settings	Update Zone Configurations	Select this option to enable the modification of zone settings.
	Use Existing Zone Aliases	Select this option to use predefined Zone Aliases regardless of the naming conventions the user specifies. If you do not select this option, the system selects Zone Aliases that follow the naming conventions. In either case, if there are no existing Zone Aliases, the system creates new Zone Aliases that follow the naming conventions.
	Update Current Active Zone Configuration	Select this option to add a Zone to the active Zone Configuration.
	Zone Configurations to Update	To add a zone to a Zone Configuration other than the active configuration, specify the name of the Zone Configuration in which to add the zone.
	Script for Zone Naming	Specify the naming convention script that determines the Zone name for the path.
	Script for Host Zone Alias Naming	Specify the naming convention script that determines the Zone Alias name for the host port.
	Script for Storage Zone Alias Naming	Specify the naming convention script that determines the Zone Alias name for the storage port.
Datastore Settings	Datastore Cluster	Specify the datastore cluster to which to add the datastores you are creating.

Navigation pane	Settings pane	Description
	Datastore Name Prefix	Specify the prefix of the datastore. A 4-digit sequential number is automatically added after the prefix.
	VMFS Version	Specify the VMFS version for the datastore.
	Block Size	Specify the block size for the datastore.
	Storage I/O Control	Select this option to enable storage I/O control for the datastore.
	Threshold Type	Specify the type of threshold, either "Latency Threshold" or "Throughput Threshold".
	Threshold Value	Specify the value of the latency threshold if storage I/O control is enabled.
Notification Settings	To Addresses	Specify the To email addresses. Use a comma to separate multiple addresses.
	Cc Addresses	Specify the Cc email addresses. Use a comma to separate multiple addresses.
	Bcc Addresses	Specify the Bcc email addresses. Use a comma to separate multiple addresses.
	Encoding	Specify us-ascii, iso-2022-jp, shift_jis, euc-jp, or utf-8 for the email encoding.
	Subject	Specify the email subject.
	Body	Specify the email body.

Navigation pane	Settings pane	Description
	Response Input Dialog Box	Specify HTML or text in the Response Entry dialog box. To change a service property value in the Response Entry dialog box, specify the property key for the "name" attribute of an input tag (<input>) or a select tag (<select>).
	Response Timeout	Specify a timeout (in minutes) for the Response Entry dialog box. The range is between 1 and 20,160 minutes.
<p>Notes:</p> <p>* If you select Automatic for Pool Selection in the Volume Settings panel of the Edit/Submit Service window, the pool is automatically selected using the following criteria:</p> <ol style="list-style-type: none"> 1. Select the pool with the largest free pool capacity after volume allocation. 2. If the free pool capacity is the same, select the pool on the storage system with the higher priority in the following table. 3. If no storage port is found where an LU path with the selected storage system and pool combination can be created, go back to 1 and select the next candidate pool. 		

Navigation pane		Settings pane	Description
Priority	Storage model		
1	VSP 5200, 5600, 5200H, 5600H		
2	VSP 5100, 5500, 5100H, 5500H		
3	VSP F1500, VSP G1500, VSP G1000		
4	VSP One B28		
5	VSP One B26		
6	VSP One B24		
7	VSP E1090, VSP E1090H		
8	VSP E990		
9	VSP E790, VSP E790H		
10	VSP E590, VSP E590H		
11	VSP F900, VSP G900		
12	VSP F700, VSP G700		
13	VSP F370, VSP G370		
14	VSP F350, VSP G350		
15	VSP F800, VSP G800, VSP N800		
16	VSP F400, VSP F600, VSP G400, VSP G600, VSP N400, VSP N600		
17	VSP G200		

Zone naming conventions

The following table lists the zone naming conventions for use with the Allocate Volumes, Fabric, and Datastore for ESXi Host service template.

Type	Zone name	Zone alias name (Host side/ Storage side)
Input	<p>One object has the following properties:</p> <ul style="list-style-type: none"> hostName: Host name hostPortWorldWideName: WWN of HBA. Separator notation is based on FC switch manager services. storagePortWorldWideName: WWN of CHA. Separator notation is based on FC switch manager services. storageSystemSerialNumber: Serial number of physical storage system storagePortName: Display port name of the storage system serviceProperties: List of the service properties passed to the plug-in 	
Output	Zone name to add to the specified Zone Configuration.	Zone alias name to add to the zone specified in the Zone name convention.
Handling when the output is the same name	<p>Same zone name of the same fabric refers to the same zone.</p> <p>In the case of an existing zone: Add an alias in the zone and add to the Zone Configuration.</p> <p>null: Do not create a zone.</p>	<p>Same zone alias name of the same fabric refers to the same alias.</p> <p>In the case of an existing alias: Add WWN in the alias and add to the Zone.</p> <p>null: Do not create an alias.</p>
Handling when unavailable characters are used for output	<p>Characters other than alphanumeric characters and "_" are converted to "_" and become part of the name.</p>	
If the output string is too long	When the output string is over 60 characters, the 61st and subsequent characters are truncated.	When the output string is over 64 characters or more, the 65th and subsequent characters are truncated.

Type	Zone name	Zone alias name (Host side/ Storage side)
Validation	<p>An error occurs if the return value is one of following:</p> <ul style="list-style-type: none"> ▪ Other than String ▪ When starting from non-alphabetic characters. ▪ When having a non-standard prefix for the zone. ("LSAN_", "TI_", "QOS[HML][0-9]+_")(case ignored) 	<p>An error occurs if the return value is one of following:</p> <ul style="list-style-type: none"> ▪ Other than String ▪ When starting from non-alphabetic characters.

Global-Active Device service template

The Ops Center Automator Global-Active Device Setup service template is provided with the software and is preconfigured. This service template enables you to automate portions of the GAD setup process. This service creates virtual storage machines, assigns Quorum Disk IDs, creates remote paths, and allocates command devices to create global-active devices. Using this template, you can set up some of the basic requirements the first time you use the template and then skip those steps whenever you use template again. You can then use the GAD configuration for any purpose as a prerequisite for using the Online Migration service template.

Supported platforms

For information on supported platforms, see [Service template supported platforms \(on page 146\)](#).

Default ports

The port number and their uses are as follows:

Port number	Use
22015	Communication from Ops Center Automator client to Ops Center Automator server.
22016	Secure communication from Ops Center Automator client to Ops Center Automator server.
23450	Communication from Ops Center Automator to Ops Center API Configuration Manager.
23451	Secure communication from Ops Center Automator to Ops Center API Configuration Manager.

Setting up global-active device

Setting up GAD consists of several steps. However, many of the steps are now automated when you use the Ops Center Automator GAD Setup service. The following procedure shows the steps to set up GAD when using the service.

Procedure

1. Review the required software and setup prerequisites listed in [Global-Active Device Setup: Service details \(on page 294\)](#).



Note: All setup prerequisites are included in this procedure, but you can find specifics based on storage system model in the service details topic.

2. Connect the storage system ports.
 - a. Physically connect the ports between the primary (source) storage system and the secondary (target) storage system.
 - b. If you are using Fibre Channel (FC) for the remote connection between the source and target storage systems, set the zone information.
 - If you are using a Brocade FC switch, see the Brocade Network Advisor (BNA) documentation for more information.
 - If you are using a Cisco FC switch, see the Data Center Network Manager (DCNM) documentation for more information.
 - c. Physically connect the ports between the source and target storage system and the storage system on which you plan to create the Quorum disk.
 - d. If you are using Fibre Channel (FC) for the remote connection between the source and target storage systems, and the storage system with the Quorum disk, set the zone information using BNA or DCNM.
3. Complete the following Quorum Disk setup steps using either Command Control Interface (CCI) or Storage Navigator. (Not required if using diskless Quorum)
For more information, see the *Command Control Interface Command Reference*.
 - a. Set the attributes of the remote connection port and the port connected to the Quorum Disk.
 - b. Create the volume for the Quorum disk.
 - c. Register the Quorum disk as an external volume on both the source and target storage systems.
4. Complete the following Ops Center API Configuration Manager setup steps. You complete these steps one time and do not need to repeat them.
 - a. In Ops Center Automator, set up a web service connection to both Ops Center API Configuration Manager servers managing the storage systems.

See [Configuring Ops Center API Configuration Manager connections \(on page 87\)](#) for more information.

- b. Register the source storage system and the target storage system into Ops Center API Configuration Manager.
 - To complete this task from the Ops Center Automator UI, see [Registering storage systems to an Ops Center API Configuration Manager connection \(on page 93\)](#).
 - To complete this task using Ops Center API Configuration Manager, see the *Hitachi Ops Center API Configuration Manager REST API Reference Guide*.
5. In Ops Center Automator, complete the following steps:
 - a. On the **Services** tab, select the GAD Setup service, and in the service preview pane, click **Create Request**.
 - b. Configure the GAD Setup service by entering the required information. For more information on the required parameter settings, see [Global-Active Device Setup: Service details \(on page 294\)](#).
 The configuration information you enter enables the service to complete the following actions when you run the GAD Setup service:
 - Register the specified volume as a Quorum Disk.
 - Create a remote path group using the combination of the selected ports.
 - (Optionally) Allocate the command device for the source and target storage system to the pair management server. You can select whether to create the command device when you submit the service.
 - Create a Virtual Storage Machine (VSM) with the serial number of the source storage system on the target storage system.
 - c. Submit the service and verify that the task completed successfully.
6. Install CCI on the pair management server.
 See the Global-Active Device User Guide for more information.

Global-Active Device Setup: Service details

This service creates virtual storage machines, assigns Quorum disk IDs, creates remote paths, and allocates command devices to create global-active devices.

Software and setup prerequisites

For software and setup prerequisites, see [Service template prerequisites \(on page 126\)](#).

Edit Service settings

The following service template details apply to the Global-Active Device Setup service template.

Navigation pane	Settings pane	Description
Select Storage System	Primary Configuration Manager Connection	Specify the Configuration Manager connection of the primary (source) storage system for migration.
	Primary Storage System	Specify the primary (source) storage system for migration.
	Secondary Configuration Manager Connection	Specify the Configuration Manager connection of the secondary (target) storage system for migration.
	Secondary Storage System	Specify the secondary (target) storage system for migration.
Virtual Storage Machine Settings	VSM Configuration	Select whether to create a Virtual Storage Machine (VSM).
	VSM Creation Type	Select a VSM creation type. The options are: <ul style="list-style-type: none"> ▪ Duplicate the primary storage system VSM on the secondary storage system. ▪ Create new VSMs on both the primary and secondary storage systems.
	Virtual Storage Machine	Specify the VSM on the primary storage as the migration source.
	Virtual Model	Specify the virtual model to create a new user-defined virtual storage machine.
	Virtual Serial Number	Specify the virtual serial number to create a new user-defined virtual storage machine.

Navigation pane	Settings pane	Description
	Resource Group Name	Specify the name of the resource group on the primary and secondary storage for the virtual storage machines.
Quorum Settings	Quorum Configuration	Select whether to configure a Quorum disk.
	Quorum Disk ID	Specify the Quorum disk ID.
	Add Quorum Disk without Volume	Check this when defining a Quorum disk which does not need external volumes.
	Volume Filter (Primary)	Use the filters to display only the primary volumes that match the specified criteria.
	Volume (Primary)	Select the volume to use as the Quorum disk on the primary storage.
	Volume Filter (Secondary)	Use the filters to display only the secondary volumes that match the specified criteria.
	Volume (Secondary)	Select the volume to use as the Quorum disk on the secondary storage.
	Primary CCI Instance Min	Specify the minimum value for the range of CCI instances to run on the primary storage.
	Primary CCI Instance Max	Specify the maximum value for the range of CCI instances to run on the primary storage.
	Secondary CCI Instance Min	Specify the minimum value for the range of CCI instances to run on the secondary storage.
	Secondary CCI Instance Max	Specify the maximum value for the range of CCI instances to run on the secondary storage.

Navigation pane	Settings pane	Description
Remote Path Setting	Configure Remote Paths	Select whether to set remote path groups.
	Remote Path Setting	Specify the remote path.
	Primary Storage MCU Initiator Port	Select the primary storage system MCU initiator port from the list.
	Primary Storage RCU Target Port	Select the primary storage system RCU target port from the list.
	Secondary Storage MCU Initiator Port	Select the secondary storage system MCU initiator port from the list.
	Secondary Storage RCU Target Port	Select the secondary storage system RCU target port from the list.
	Path Group ID	Specify the path group ID.
Select Pair Management Servers	Skip Pair Management Server Configurations (Primary)	Skip configuring a pair management server for the primary storage system if the configuration already exists.
	Use Existing or Create New (Primary)	Select whether to use an existing host group or SCSI target or create a new host group or iSCSI target.
	Existing Host Groups or iSCSI Targets (Primary)	Select an existing host group or iSCSI Target.
	Port Type (Primary)	Select the Port type.
	Host Group Settings (Primary)	Specifies the parameters needed to create a new host group/iSCSI target. Port: Specifies the port of the host group target. WWN Settings: Specifies the WWN settings when using the fibre port setting. Host Group Name: Specifies the host group name when using the fibre port type.

Navigation pane	Settings pane	Description
		<p>iSCSI Settings: Specifies the iSCSI settings when using the iSCSI port type.</p> <p>iSCSI Target Name: Specifies the iSCSI target name when using the iSCSI port type.</p> <p>Host Mode: Specifies the host mode.</p> <p>Host Mode Options: Specifies the host mode options.</p>
	Skip Pair Management Server Configurations (Secondary)	Skip configuring a Pair Management Server for the Secondary Storage if the configuration already exists.
	Use Existing or Create New (Secondary)	Select whether to use an existing host group or iSCSI target or create a new host group or iSCSI target.
	Existing Host Groups or iSCSI Targets (Secondary)	Select an existing host group or iSCSI target
	Port Type (Secondary)	Select the Port Type.
	Host Group Settings (Secondary)	<p>Specifies the parameters needed to create a new Host Group/iSCSI target.</p> <p>Port: Specifies the port of the host group target.</p> <p>WWN Settings: Specifies the WWN settings when using the fibre port setting.</p> <p>Host Group Name: Specifies the host group name when using the fibre port type.</p> <p>iSCSI Settings: Specifies the iSCSI settings when using the iSCSI port type.</p>

Navigation pane	Settings pane	Description
		<p>iSCSI Target Name: Specifies the iSCSI target name when using the iSCSI port type.</p> <p>Host Mode: Specifies the host mode.</p> <p>Host Mode Options: Specifies the host mode options.</p>
Pair Management Server Settings	Security Enabled	Select this option to enable command device security.
	User Authentication Enabled	Select this option to enable user authentication.
	Device Group Definition Enabled	Select this option to enable device group definition.
	Volume Capacity	Specify the volume capacity.
	Volume Label	Specify the volume label.
	Volume Type (Primary)	Select the primary command device volume type.
	Pool (Primary)	Select the pool in which to create the primary command device.
	Parity Group (Primary)	Select the parity group.
	LDEV ID Starts from (Primary)	Specify the startup LDEV ID as a hexadecimal number for the volume to allocate. If this field is listed as "allocated" in another template, you must change it.
	LUN Starts From (Primary)	Specify the starting logical unit number assigned to the volume for a host.
	Select Capacity Saving Function (Primary)	Specify the Capacity Saving Function for the target volumes. Refer to your storage system product documentation for the optimal setting.

Navigation pane	Settings pane	Description
	Select Capacity Saving Mode (Primary)	Specify the Capacity Saving Mode for the target volumes. Refer to your storage system product documentation for the optimal setting.
	Volume Type (Secondary)	Select the secondary command device volume type.
	Pool (Secondary)	Select the pool in which to create the secondary command device.
	Parity Group (Secondary)	Select the parity group.
	LDEV ID Starts From (Secondary)	Specify the startup LDEV ID as a hexadecimal number for the volume to allocate. If this field is listed as "allocated" in another template, you must change it.
	LUN Starts From (Secondary)	Specify the starting logical unit number assigned to the volume for a host.
	Select Capacity Saving Function (Secondary)	Specify the Capacity Saving Function for the target volumes. Refer to your storage system product documentation for the optimal setting.
	Select Capacity Saving Mode (Secondary)	Specify the Capacity Saving Mode for the target volumes. Refer to your storage system product documentation for the optimal setting.

Submit Service settings

The following service template details apply to the Global-Active Device Setup service template.

Navigation pane	Settings pane	Description
Select Storage System	Primary Configuration Manager Connection	Specify the Configuration Manager connection of the primary (source) storage system for migration.
	Primary Storage System	Specify the primary (source) storage system for migration.
	Secondary Configuration Manager Connection	Specify the Configuration Manager connection of the secondary (target) storage system for migration.
	Secondary Storage System	Specify the secondary (target) storage system for migration.
Virtual Storage Machine Settings	VSM Configuration	Select whether to create a Virtual Storage Machine (VSM).
	VSM Creation Type	Select a VSM creation type. The options are: <ul style="list-style-type: none"> ▪ Duplicate the primary storage system VSM on the secondary storage system. ▪ Create new VSMs on both the primary and secondary storage systems.
	Virtual Storage Machine	Specify the VSM on the primary storage as the migration source.
	Virtual Model	Specify the virtual model to create a new user-defined virtual storage machine.
	Virtual Serial Number	Specify the virtual serial number to create a new user-defined virtual storage machine.

Navigation pane	Settings pane	Description
	Resource Group Name	Specify the name of the resource group on the primary and secondary storage for the virtual storage machines.
Quorum Settings	Quorum Configuration	Select whether to configure a Quorum disk.
	Quorum Disk ID	Specify the Quorum disk ID.
	Add Quorum Disk without Volume	Verify this when defining a Quorum disk which does not need external volumes.
	Volume Filter (Primary)	Use the filters to display only the primary volumes that match the specified criteria.
	Volume (Primary)	Select the volume to use as the Quorum disk on the primary storage system.
	Volume Filter (Secondary)	Use the filters to display only the secondary volumes that match the specified criteria.
	Volume (Secondary)	Select the volume to use as the Quorum disk on the secondary storage system.
Remote Path Setting	Configure Remote Paths	Select whether to set remote path groups.
	Remote Path Setting	Specify the remote path.
	Primary Storage MCU Initiator Port	Select the primary storage system MCU initiator port from the list.
	Primary Storage RCU Target Port	Select the primary storage system RCU target port from the list.
	Secondary Storage MCU Initiator Port	Select the secondary storage system MCU initiator port from the list.
	Secondary Storage RCU Target Port	Select the secondary storage system RCU target port from the list.

Navigation pane	Settings pane	Description
	Path Group ID	Specify the path group ID.
Select Pair Management Servers	Skip Pair Management Server Configurations (Primary)	Skip configuring a pair management server for the primary storage system if the configuration already exists.
	Use Existing or Create New (Primary)	Select whether to use an existing host group or iSCSI target or create a new host group or iSCSI target.
	Existing Host Groups or iSCSI Targets (Primary)	Select an existing host group or iSCSI Target.
	Port Type (Primary)	Select the port type.
	Host Group Settings (Primary)	<p>Specifies the parameters needed to create a new host group or iSCSI target.</p> <p>Port: Specifies the port of the host group target.</p> <p>WWN Settings: Specifies the WWN settings when using the fibre port setting.</p> <p>Host Group Name: Specifies the host group name when using the fibre port type.</p> <p>iSCSI Settings: Specifies the iSCSI settings when using the iSCSI port type.</p> <p>iSCSI Target Name: Specifies the iSCSI target name when using the iSCSI port type.</p> <p>Host Mode: Specifies the host mode.</p> <p>Host Mode Options: Specifies the host mode options.</p>

Navigation pane	Settings pane	Description
	Skip Pair Management Server Configurations (Secondary)	Skip configuring a pair management server for the secondary storage system if the configuration already exists.
	Use Existing or Create New (Secondary)	Select whether to use an existing host group or iSCSI target or create a new host group or iSCSI target.
	Existing Host Groups or iSCSI Targets (Secondary)	Select an existing host group or iSCSI target
	Port Type (Secondary)	Select the port type.
	Host Group Settings (Secondary)	Specifies the parameters needed to create a new host group or iSCSI target. Port: Specifies the port of the host group target. WWN Settings: Specifies the WWN settings when using the fibre port setting. Host Group Name: Specifies the host group name when using the fibre port type. iSCSI Settings: Specifies the iSCSI settings when using the iSCSI port type. iSCSI Target Name: Specifies the iSCSI target name when using the iSCSI port type. Host Mode: Specifies the host mode. Host Mode Options: Specifies the host mode options.
Pair Management Server Settings	Security Enabled	Select this option to enable command device security.
	User Authentication Enabled	Select this option to enable user authentication.

Navigation pane	Settings pane	Description
	Device Group Definition Enabled	Select this option to enable device group definition.
	Volume Capacity	Specify the volume capacity.
	Volume Label	Specify the volume label.
	Volume Type (Primary)	Select the primary command device volume type.
	Pool (Primary)	Select the pool in which to create the primary command device.
	Parity Group (Primary)	Select the parity group.
	LDEV ID Starts from (Primary)	Specify the startup LDEV ID as a hexadecimal number for the volume to allocate. If this field is listed as "allocated" in another template, you must change it.
	LUN Starts From (Primary)	Specify the starting logical unit number assigned to the volume for a host.
	Select Capacity Saving Function (Primary)	Specify the Capacity Saving Function for the target volumes. Refer to your storage system product documentation for the optimal setting.
	Select Capacity Saving Mode (Primary)	Specify the Capacity Saving Mode for the target volumes. Refer to your storage system product documentation for the optimal setting.
	Volume Type (Secondary)	Select the secondary command device volume type.
	Pool (Secondary)	Select the pool in which to create the secondary command device.
	Parity Group (Secondary)	Select the parity group.

Navigation pane	Settings pane	Description
	LDEV ID Starts From (Secondary)	Specify the startup LDEV ID as a hexadecimal number for the volume to allocate. If this field is listed as "allocated" in another template, you must change it.
	LUN Starts From (Secondary)	Specify the starting logical unit number assigned to the volume for a host.
	Select Capacity Saving Function (Secondary)	Specify the Capacity Saving Function for the target volumes. Refer to your storage system product documentation for the optimal setting.
	Select Capacity Saving Mode (Secondary)	Specify the Capacity Saving Mode for the target volumes. Refer to your storage system product documentation for the optimal setting.

Online migration with Configuration Manager service templates

The Ops Center Automator Online migration with Configuration Manager service templates are provided with the software and is preconfigured. These service templates use global-active device and enable you to automate portions of the online migration process.

You can watch a [video](#) on how to use these service templates.

Create Online Migration Pair

This service runs from the creation of zones to the creation of copy pairs for online host migration through Configuration Manager. After this service is complete, you must submit the Migrate Data for Online Migration Pair service to complete the migration.

Create Online Migration Pairs for Multiple Hosts

This service enables you to submit a Create Online Migration Pair service task for each specified host. After the auto-submitted tasks are complete, you must submit the Migrate Data for Online Migration Pair service for each task to complete the migration.

Migrate Data for Online Migration Pair

This service runs from the swap of copy pairs to the deletion of source volumes for online host migration through Configuration Manager. Before submitting this service, the Create Online Migration Pair service must be completed.

Clean up Online Migration Pair

This service enables you to clean up the resources created by the Create Online Migration Pair task.

Notes editing feature

The Create Online Migration Pair and Create Online Migration Pairs for Multiple Hosts services have a Notes feature to automatically describe the current migration progress. By checking Notes of these services, the user can determine the migration progress of the task (for example, whether the Migrate Data for Online Migration Pair task has been run) and decide the next action to take. The user can specify the first string of Notes as a filter to display the Create Online Migration Pair tasks in a specific migration progress.



Note: Whether the user runs the Create Online Migration Pair service or the Create Online Migration Pairs for Multiple Hosts service, the migration progress will be added only to Notes of the Create Online Migration Pair task.

The following strings are output to Notes:

- `Initial copy started`: Indicates whether the Migrate Data for Online Migration Pair task can be run when the Create Online Migration Pair task is terminated (for example, due to a server restart).
- `Initial copy finished`: Indicates whether the Create Online Migration Pair task has been finished.
- `Migration started (task id: task_id)`: Indicates whether the Migrate Data for Online Migration Pair task for the indicated task has been started.
- `Migration finished`: Indicates whether the Migrate Data for Online Migration Pair task has been finished.
- `Cleanup started (task id: task_id)`: Indicates whether the Clean up Online Migration Pair task for the indicated task has been started.
- `Cleanup finished`: Indicates whether the Clean up Online Migration Pair task has been finished.



Note: When using this feature, be aware of the following:

- Filtering can be performed in the task list window.
- The Online migration with Configuration Manager services must be in the same service group.
- Notes can contain a maximum of 1024 characters.
- Do not use Ops Center Automator to edit Notes of the Create Online Migration Pair tasks while the Create Online Migration Pair, Migrate Data for Online Migration Pair, and Clean up Online Migration Pair tasks are running.

Supported platforms

For information on supported platforms, see [Service template supported platforms \(on page 146\)](#).



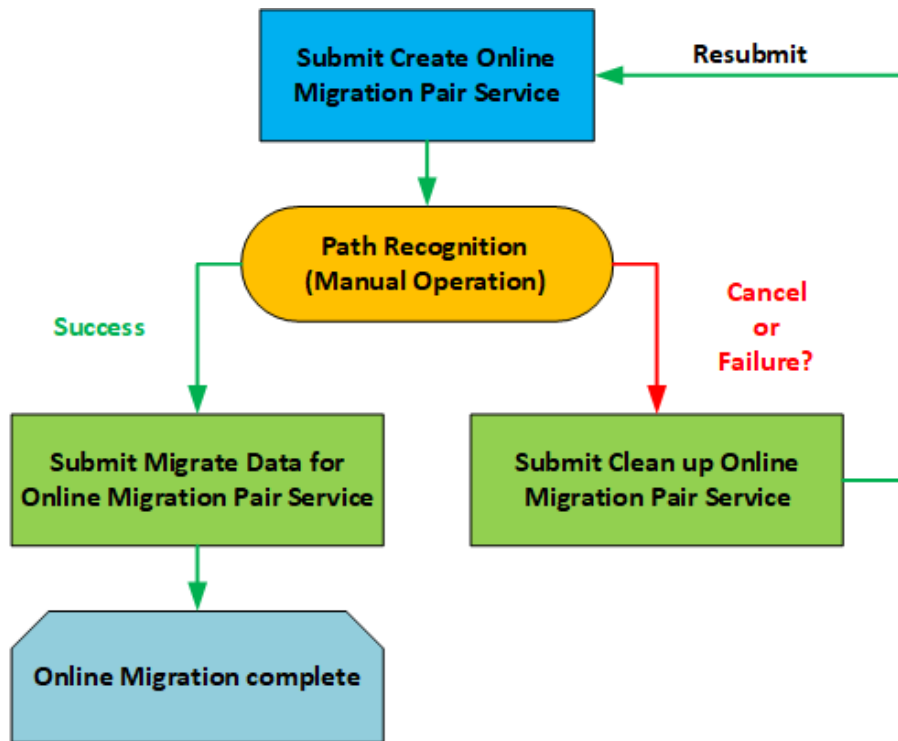
Note: For information on the supported platforms required to run multiple tasks concurrently, see [Running multiple tasks \(on page 160\)](#).

Default ports

Port number	Use
443*	Secure communication from Ops Center Automator to Ops Center Administrator.
22015	Communication from Ops Center Automator client to Ops Center Automator server.
22016	Secure communication from Ops Center Automator client to Ops Center Automator server.
23450	Communication from Ops Center Automator to Ops Center API Configuration Manager.
23451	Secure communication from Ops Center Automator to Ops Center API Configuration Manager.
* Create Online Migration Pair	

Migrating online data with Configuration Manager

Setting up online migration consists of several steps. However, many of the steps are now automated when you use the Ops Center Automator Create Online Migration Pair, Migrate Data for Online Migration Pair, and Clean up Online Migration Pair services.



The following procedure provides the steps required to set up and migrate online data when using the service.

Procedure

1. If GAD is not set up, complete the steps in [Setting up global-active device \(on page 293\)](#).
2. Verify the setup prerequisites and required software listed in [Service template prerequisites \(on page 126\)](#). The setup prerequisites consist of creating various Ops Center Automator resources as well as setting secure communications between the Ops Center Administrator server and the Ops Center Automator server.
3. Complete the following resource setup steps using either Command Control Interface (CCI) or Storage Navigator.

For more information, see the *Command Control Interface Command Reference*.

- a. Register resources to the VSM.
 - b. If you want to specify the source resource as Volumes, identify the volume to migrate.
 - c. Delete any replication pairs in the source migration source volume.
If a local/remote pair is set in the migration source volume, the GAD pair is not created.
4. In Ops Center Automator, verify that the following web service connections exist. If not, create them as needed.



Note: If you plan to set up secure communication between Ops Center Automator and any of the following servers, you must do so before you create the web service connection. For additional information, see "Importing certificates for web service connections" in the *Hitachi Ops Center Automator Installation and Configuration Guide*.

- Web service connection to the Ops Center Administrator server where the migration source host is registered.
- (Optionally) Web service connection to Brocade FC switches or Data Center Network Manager (DCNM).

You complete this step one time and do not need to repeat it in the future.

For more information, see [Configuring Web Service Connections \(on page 86\)](#).

5. In Ops Center Automator, complete the following steps:

- a. On the **Services** tab, select the Create Online Migration Pair service, and in the service preview pane, click **Create Request**.
- b. Configure the Create Online Migration Pair service by entering the required information. For more information on the required parameter settings, see [Create Online Migration Pair: Service details \(on page 312\)](#).

The configuration information you enter enables the service to complete the required tasks when you submit the Create Online Migration Pair service.

- c. Submit the service.

The service completes the following actions:



Note: If you want to submit multiple Create Online Migration Pair services at once, use the Create Online Migration Pairs for Multiple Hosts service.

- Creates the zone information between the target storage and the host.
- Allocates a path on the target volume that matches the path on the source volume.
- Creates a diskless Quorum for use with Global-Active Device. Acquire and creates a free Quorum ID common to the source storage system and target storage system. If you want to enable the Use Diskless Quorum option, see [Create Online Migration Pair: Service details \(on page 312\)](#).
- Creates a Global-Active Device pair with Ops Center API Configuration Manager.
- Reclaims zero pages of Global-Active Device S-Vol if the Run Zero Page Reclaim property is selected.

After finishing the previous actions, the service pauses and waits for you to manually verify that you have completed the above tasks.



Note: If you specify the same Source Storage and Target Storage in the Create Online Migration Pair service and submit multiple tasks at the same time, the tasks might fail. In this case, check the pair status of the specified Source Volume. If the Global-Active Device pair was created, run Clean up Online Migration Pair, and then resubmit the task.

6. Switch the path from the source volume to the target volume so that the host recognizes the target volume path using one of the following methods.
 - Log in to the host and use the multipath management software to switch the path.
 - If the host is in a cluster configuration, use the cluster management software to change the settings.
7. Return to the Ops Center Automator UI and do one of the following:
 - To resubmit the Create Online Migration Pair task if it failed or to cancel the migration, you must submit the Clean up Online Migration Pair service to delete the resources created in the target storage system. See [Clean up Online Migration Pair: Service details \(on page 343\)](#) for more information.
 - If the Create Online Migration Pair task completes successfully, you can submit the Migrate Data for Online Migration Pair service.
8. In Ops Center Automator, complete the following steps:
 - a. On the **Services** tab, select the Migrate Data for Online Migration Pair service, and in the service preview pane, click **Create Request**.
 - b. Configure the Migrate Data for Online Migration Pair service by entering the required information. For more information on the required parameter settings, see [Migrate Data for Online Migration Pair: Service details \(on page 341\)](#).
The configuration information you enter enables the service to complete the required tasks when you submit the Create Online Migration Pair service.
 - c. Submit the service.

The task starts running and with the following automated actions:

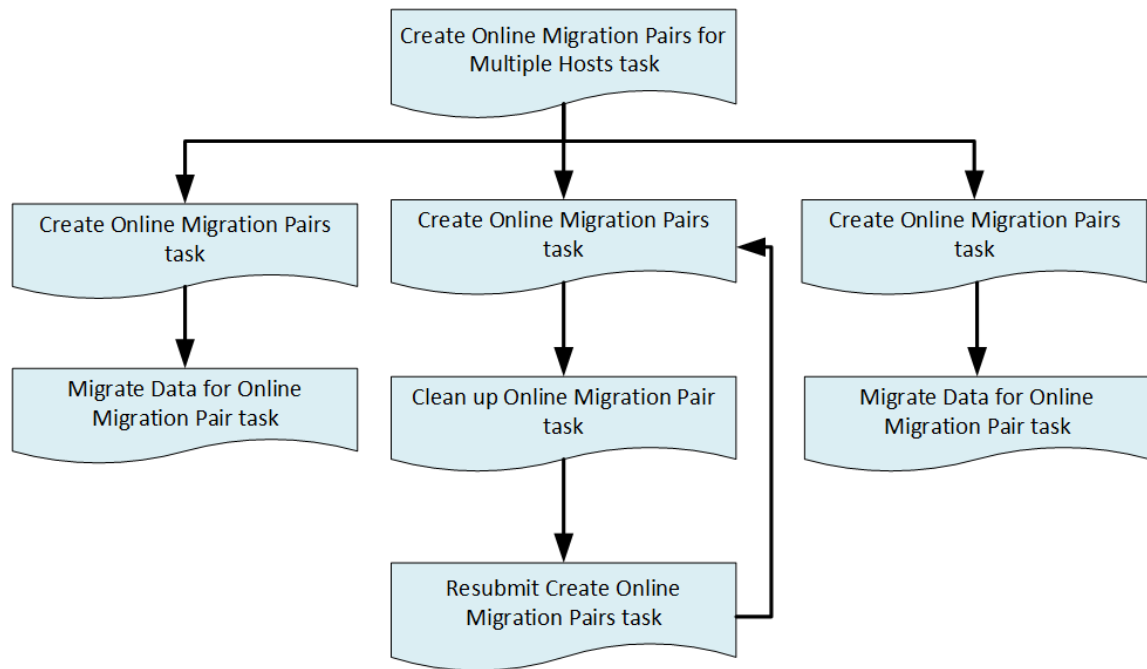
- Deletes the Global-Active Device pair with Ops Center API Configuration Manager.
- Unallocates the source volume and path with Ops Center API Configuration Manager.
- Deletes the diskless Quorum if you are using diskless Quorum.
- (Optionally) Deletes the source volume and the unnecessary Host Group using Ops Center API Configuration Manager.



Note: Do not select this option during template configuration if you want to return to the original status if the migration fails.

Migrating online pairs for multiple hosts

The Ops Center Automator Create Online Migration Pairs for Multiple Hosts service allows you to submit online migration jobs using multiple hosts. This template has the same input items as the Create Online Migration Pair service, and when multiple hosts are selected for task, the Create Online Migration Pair task automatically runs as one host and one task.



Create Online Migration Pair: Service details

The Create Online Migration Pair service template runs from the creation of zones to the creation of copy pairs for online host migration through Configuration Manager. After this service is complete, you must submit the Migrate Data for Online Migration Pair service to complete the migration.

When using this template, be aware of the following:

- The Online Migration with Configuration Manager service template that existed in v10.5.1 or earlier has been split into two service templates: Create Online Migration Pair and Migrate Data for Online Migration Pair. We recommend that you use the new service templates.
- In the configuration where the source volumes have clone pairs, before running the tasks, wait a few minutes after the clone process, or update the storage system cache of configuration information.
- In the configuration where the source volumes have clone pairs, make sure that no secondary volume of the clone pairs is included in the source volumes, and that no secondary volume of the clone pairs is allocated to the selected host as source hosts.
- When you use the Capacity Saving settings, remember that Capacity Saving works even when copying data by GAD, except when After migration is selected for the Set Capacity Saving property. See "About adaptive data reduction" in the *Provisioning Guide* for your storage system in advance.
- By default, this service automatically enables the host mode option "88. Port Consolidation" for the target host groups when the migration is performed. This lets you specify the same port on the target storage system even if there are multiple source storage systems for the same server. In v10.9.3 or later, you can disable this function by unchecking the "Set Host Mode Option 88 to Host Groups automatically" option.

- When you create a new host group, the host group number of the specified resource group is given priority. If the host group numbers that are registered in the specified resource group are insufficient, the host group number in the resource group named "meta_resource" is used.
- If the Use Diskless Quorum option is enabled and the task fails and one of the following conditions are met, the automatically created Diskless Quorum might remain. In this case, check the Quorum ID shown in the message and manually delete the Diskless Quorum:
 - KNAE07604-I is not output to the task log. This message is output for the source and target storage systems respectively.
 - KNAE07606-I is output to the task log.
- The features integrating with FC switches are not supported when you select the "Host Mappings" option for "Mappings" in Target Settings. When you use any feature integrating with FC switches such as zoning, select the "Storage Port Mappings" option for "Mappings".

Software and setup prerequisites

For software and setup prerequisites, see [Service template prerequisites \(on page 126\)](#).

Edit service settings

The following table lists the Edit Service settings for the Create Online Migration Pair service template.

Navigation pane	Settings pane	Description
Source Settings	Source Selection	Specify the source resource as volumes or hosts.
	Source Storage Management Connection	Specify the source storage management connection for selecting migration source hosts.
	Source Hosts Filter	Use the filters to display only the source hosts that match the specified criteria.
	Join Host Filters By	Use the "and" and the "or" operators to join multiple filters.
	Source Host Filter (Rows/ Page)	Use the filter to display only the specified number of source hosts.
	Source Host Filter (Current Page)	Use the filter to display only the specified page number of the rows per page number of source hosts.

Navigation pane	Settings pane	Description
	Source Hosts	Specify the source hosts. If you select a host to which the clone copy pair volume is attached, confirm that the volume is not the secondary volume of the clone copy pair.
	Source Configuration Manager Connection	Specify the source Configuration Manager connection for migration.
	Source Storage System	Specify the source storage system for migration.
	Source Volume Filter (Resource Group)	Use the filters to display only the source volumes that belong to the resource group.
	Resource Group Name	Select the resource group to filter.
	Source Volume Filter	Use the filters to display only the source volumes that match the specified criteria.
	Join Filters By	Use the "and" and the "or" operators to join multiple filters.
	Source Volume Filter (Rows/Page)	Use the filter to display only the specified number of source volumes.
	Source Volume Filter (Current Page)	Use the filter to display only the specified page number of the rows per page number of source volumes.
	Source Volumes	Specify the source volumes. If you select a host to which the clone copy pair volume is attached, confirm that the volume is not the secondary volume of the clone copy pair.
Target Settings	Target Configuration Manager Connection	Specify the target Configuration Manager connection for migration.
	Target Storage System	Specify the target storage system for migration.

Navigation pane	Settings pane	Description
		<p>In the "Compression Acceleration" column, "unavailable" is displayed in the following cases:</p> <ul style="list-style-type: none"> ▪ The migration target storage system does not have the required settings to enable Compression Acceleration. ▪ The migration target storage system is a storage model that does not support enabling Compression Acceleration. <p>If "available" is displayed, Compression Acceleration will be automatically enabled when the capacity saving function is enabled. If "unavailable" is displayed, Compression Acceleration will be automatically disabled when the capacity saving function is enabled.</p>
	Target Resource Group	Specify the target resource group.
	Target Pool	Specify the target pool.
	LDEV ID range starts from	Search for undefined LDEV IDs and allocate target volumes in order from the specified physical LDEV ID. If a physical LDEV ID is not specified, volumes with the same LDEV ID are allocated first.
	LDEV ID range ends at	Specify the last LDEV ID in the LDEV ID range. If the last LDEV ID is not specified, LDEV IDs are used up to the storage system maximum.
	Resource Group for preferential use with LDEV IDs	Specify the resource group to use first when searching for available physical LDEV IDs. If there are not enough available LDEV IDs in the resource group with the specified option, LDEV IDs in the resource group with the unspecified option are also used.
	Mappings	Specify the Storage Port Mappings or Host Mappings.

Navigation pane	Settings pane	Description
	Storage Port Mappings	Specify mappings for the source and target storage ports. Based on the mappings, the system configures the I/O path between the host and the target storage ports.
	Source Storage Port	Select a source storage port from the list of registered ports.
	Target Storage Ports	Select one or more target storage ports from the list of registered ports.
	Host Mode / Host Mode Options	Specify the parameters for creating new Host Mode and Host Mode Options. If a host group/iSCSI Target already exists at the migration target, the existing value will not be changed.
	Host	Specify the host.
	Host Mode	Specify the host mode.
	Host Mode Options	Specify the host mode options.
	Host Mappings	Specify individual migration target ports for each host port (HBA). For hosts or clusters that use the same storage port on the migration source, you can configure each host port to use different storage ports on the migration target.
	Host-WWN/iSCSI name	Specify the source hosts and WWN/iSCSI name.
	Target Storage Ports	Specify the target storage ports.
	Capacity Saving Settings for Target Volumes	Specify how to apply Capacity Saving settings to target volumes. If "Same as source volumes" is specified, the settings will be applied in the same way as the Capacity Saving settings for source volumes. If "Specify Capacity Saving settings" is specified, the settings selected in the following properties will be applied.

Navigation pane	Settings pane	Description
		If you select the storage system with "Compression Acceleration" available in the "Target Storage System", then Compression Acceleration is enabled when the capacity saving function is enabled. If you select a storage system where "Compression Acceleration" is unavailable, then Compression Acceleration is disabled.
	Select Capacity Saving Function	Specify the Capacity Saving Function for the target volumes. Refer to your storage system product documentation for the optimal setting.
	Select Capacity Saving Mode	Specify the Capacity Saving Mode for the target volumes. Refer to your storage system product documentation for the optimal setting.
	Set Capacity Saving	Specify when to apply Capacity Saving settings to the target volumes. If "Before migration" is specified, the settings are applied before copying from the source volumes to the target volumes. In this case, Capacity Saving is in effect from the start of migration, but the time required for migration increases. If "After migration" is specified, the settings are applied after copying from the source volumes to the target volumes is complete. In this case, the migration time will not increase, and Capacity Saving will begin after the migration is complete.
Replication Settings	Copy Pace	Specify the copy speed. Increasing the value increases the copy speed.
	Path Group ID Selection	Specify whether to manually select the path group ID.
	Path Group ID	Specify the path group ID.
	Use Diskless Quorum	Specify whether to use automatic diskless volume creation.

Navigation pane	Settings pane	Description
	Quorum Disk	Specify the quorum disk.
	Run Zero Page Reclaim	Specify whether to run zero page reclaim when the online migration is completed.
Email Settings	Send email notification when the migration target volume path allocation is complete.	Specify whether to send an email notification when the migration target volume path allocation is complete. This enables you to confirm the path allocation listed in the email, then bring it online.
	To:	Specify the primary (To) email notification addresses.
	Cc:	Specify additional Cc email notification addresses.
	Bcc:	Specify additional Bcc email notification addresses.
	Subject:	Specify the email subject.
	Notification mail body	Specify the text of the email body.
Migration Settings	Delete the Host Group	Select the check box to delete the host group.
	Delete the Volume	Select the check box to delete the volume.
	Storage System Lock Wait Time (seconds)	Specify the lock waiting time upper limit when acquiring the storage lock while changing the configuration.
	Set Host Mode Option 88 to Host Groups automatically	Select the checkbox to set Host Mode Option 88 to Host Groups automatically.
	Add Migration Progress to Notes	Specify whether to automatically add the migration progress to Notes of the Create Online Migration Pair task. If you enable this feature, create the Migrate Data for Online Migration Pair and Clean up Online Migration Pair services in the same service group as the Create Online Migration Pair service.

Navigation pane	Settings pane	Description
Fabric Settings	Use Fabric Settings	Specify True to enable fabric information collection.
	Target Fabrics	Specify the fabric name. Separate multiple values by commas. If omitted, all fabrics defined as FOS_PrimarySwitch or DCNM in Connections will be used.
	Fabric Connection Type	Specify the fabric type, either FOS_PrimarySwitch or DCNM to filter the Category in Connections.
	Connections	Specify the connection defined in the Web Service Connections on the Administration tab. If this value is omitted, the system uses all connections that are defined for the product name listed in the Web Service Connections.
	Use Existing Zone	Specifies whether to select a predefined zone or any connectable path. If you select this option, the system selects paths within the range of the existing active Zone setting. If you do not select this option, the system selects connectable paths regardless of the existing Zone setting.
	Number of Hops Restriction	Determines whether the service will fail if there is no path that matched the specified collection range.
	Maximum Number of Hops	When using the Number of Hops Restriction option, specify the collection range by the number of hops.
Zone Settings	Update Zone Configurations	Specify True to enable the modify zone settings functionality.

Navigation pane	Settings pane	Description
	Use Existing Zone Aliases	Specify True to use predefined zone aliases regardless of the naming conventions the user specifies. If you specify False, the system selects zone aliases that follow the naming conventions. In either case, if there are no existing zone aliases, the system creates new zone aliases that follow the naming conventions.
	Update Current Active Zone Configuration	Specify True to add a zone to the active zone configuration.
	Zone Configurations to Update	To add a zone to a zone configuration other than the active configuration, specify the name of the zone configuration in which to add the zone.
	Script for Zone Naming	Specify the naming convention script that determines the zone name for the path.
	Script for Host Zone Alias Naming	Specify the naming convention script that determines the zone alias name for the host port.
	Script for Storage Zone Alias Naming	Specify the zone information.

Submit service settings

The following table lists the Submit Service settings for the Create Online Migration Pair service template.

Navigation pane	Settings pane	Description
Source Settings	Source Selection	Specify the source resource as volumes or hosts.
	Source Storage Management Connection	Specify the source storage management connection for selecting migration source hosts.
	Source Hosts Filter	Use the filters to display only the source hosts that match the specified criteria.

Navigation pane	Settings pane	Description
	Join Host Filters By	Use the "and" and the "or" operators to join multiple filters.
	Source Host Filter (Rows/ Page)	Use the filter to display only the specified number of source hosts.
	Source Host Filter (Current Page)	Use the filter to display only the specified page number of the rows per page number of source hosts.
	Source Hosts	Specify the source hosts. If you select a host to which the clone copy pair volume is attached, confirm that the volume is not the secondary volume of the clone copy pair.
	Source Configuration Manager Connection	Specify the source Configuration Manager connection for migration.
	Source Storage System	Specify the source storage system for migration.
	Source Volume Filter (Resource Group)	Use the filters to display only the source volumes that belong to the resource group.
	Resource Group Name	Select the resource group to filter.
	Source Volume Filter	Use the filters to display only the source volumes that match the specified criteria.
	Join Filters By	Use the "and" and the "or" operators to join multiple filters.
	Source Volume Filter (Rows/Page)	Use the filter to display only the specified number of source volumes.
	Source Volume Filter (Current Page)	Use the filter to display only the specified page number of the rows per page number of source volumes.
	Source Volumes	Specify the source volumes. If you select a host to which the clone copy pair volume is attached, confirm that the volume is not the secondary volume of the clone copy pair.
Target Settings	Target Configuration Manager Connection	Specify the target Configuration Manager connection for migration.

Navigation pane	Settings pane	Description
	Target Storage System	<p>Specify the target storage system for migration.</p> <p>In the "Compression Acceleration" column, "unavailable" is displayed in the following cases:</p> <ul style="list-style-type: none"> ▪ The migration target storage system does not have the required settings to enable Compression Acceleration. ▪ The migration target storage system is a storage model that does not support enabling Compression Acceleration. <p>If "available" is displayed, Compression Acceleration will be automatically enabled when the capacity saving function is enabled. If "unavailable" is displayed, Compression Acceleration will be automatically disabled when the capacity saving function is enabled.</p>
	Target Resource Group	Specify the target resource group.
	Target Pool	Specify the target pool.
	LDEV ID range starts from	Search for undefined LDEV IDs and allocate target volumes in order from the specified physical LDEV ID. If a physical LDEV ID is not specified, volumes with the same LDEV ID are allocated first.
	LDEV ID range ends at	Specify the last LDEV ID in the LDEV ID range. If the last LDEV ID is not specified, LDEV IDs are used up to the storage system maximum.
	Resource Group for preferential use with LDEV IDs	Specify the resource group to use first when searching for available physical LDEV IDs. If there are not enough available LDEV IDs in the resource group with the specified option, LDEV IDs in the resource group with the unspecified option are also used.

Navigation pane	Settings pane	Description
	Mappings	Specify the Storage Port Mappings or Host Mappings.
	Storage Port Mappings	Specify mappings for the source and target storage ports. Based on the mappings, the system configures the I/O path between the host and the target storage ports.
	Source Storage Port	Select a source storage port from the list of registered ports.
	Target Storage Ports	Select one or more target storage ports from the list of registered ports.
	Host Mode / Host Mode Options	Specify the parameters for creating new Host Mode and Host Mode Options. If a host group/iSCSI Target already exists at the migration target, the existing value will not be changed.
	Host	Specify the host.
	Host Mode	Specify the host mode.
	Host Mode Options	Specify the host mode options.
	Host Mappings	Specify individual migration target ports for each host port (HBA). For hosts or clusters that use the same storage port on the migration source, you can configure each host port to use different storage ports on the migration target.
	Host-WWN/iSCSI name	Specify the source hosts and WWN/iSCSI name.
	Target Storage Ports	Specify the target storage ports.
	Capacity Saving Settings for Target Volumes	Specify how to apply Capacity Saving settings to target volumes. If "Same as source volumes" is specified, the settings will be applied in the same way as the Capacity Saving settings for source volumes.

Navigation pane	Settings pane	Description
		<p>If "Specify Capacity Saving settings" is specified, the settings selected in the following properties will be applied.</p> <p>If you select the storage system with "Compression Acceleration" available in the "Target Storage System", then Compression Acceleration is enabled when the capacity saving function is enabled. If you select a storage system where "Compression Acceleration" is unavailable, then Compression Acceleration is disabled.</p>
	Select Capacity Saving Function	Specify the Capacity Saving Function for the target volumes. Refer to your storage system product documentation for the optimal setting.
	Select Capacity Saving Mode	Specify the Capacity Saving Mode for the target volumes. Refer to your storage system product documentation for the optimal setting.
	Set Capacity Saving	<p>Specify when to apply Capacity Saving settings to the target volumes.</p> <p>If "Before migration" is specified, the settings are applied before copying from the source volumes to the target volumes. In this case, Capacity Saving is in effect from the start of migration, but the time required for migration increases.</p> <p>If "After migration" is specified, the settings are applied after copying from the source volumes to the target volumes is complete. In this case, the migration time will not increase, and Capacity Saving will begin after the migration is complete.</p>
Replication Settings	Copy Pace	Specify the copy speed. Increasing the value increases the copy speed.
	Path Group ID Selection	Specify whether to manually select the path group ID.

Navigation pane	Settings pane	Description
	Path Group ID	Specify the path group ID.
	Use Diskless Quorum	Specify whether to use automatic diskless volume creation.
	Quorum Disk	Specify the quorum disk.
	Run Zero Page Reclaim	Specify whether to run zero page reclaim when the online migration is completed.
Email Settings	Send email notification when the migration target volume path allocation is complete.	Specify whether to send an email notification when the migration target volume path allocation is complete. This enables you to confirm the path allocation listed in the email, then bring it online.
	To:	Specify the primary (To) email notification addresses.
	Cc:	Specify additional Cc email notification addresses.
	Bcc:	Specify additional Bcc email notification addresses.
	Subject:	Specify the email subject.
	Notification mail body	Specify the text of the email body.
Migration Settings	Delete the Host Group	Select the check box to delete the host group.
	Delete the Volume	Select the check box to delete the volume.
	Storage System Lock Wait Time (seconds)	Specify the lock waiting time upper limit when acquiring the storage lock while changing the configuration.
	Set Host Mode Option 88 to Host Groups automatically	Select the checkbox to set Host Mode Option 88 to Host Groups automatically.

Navigation pane	Settings pane	Description
	Add Migration Progress to Notes	Specify whether to automatically add the migration progress to Notes of the Create Online Migration Pair task. If you enable this feature, create the Migrate Data for Online Migration Pair and Clean up Online Migration Pair services in the same service group as the Create Online Migration Pair service.
Fabric Settings	Use Fabric Settings	Specify True to enable fabric information collection.
	Target Fabrics	Specify the fabric name. Separate multiple values by commas. If omitted, all fabrics defined as FOS_PrimarySwitch or DCNM in Connections will be used.
	Fabric Connection Type	Specify the fabric type, either FOS_PrimarySwitch or DCNM to filter the Category in Connections.
	Connections	Specify the connection defined in the Web Service Connections on the Administration tab. If this value is omitted, the system uses all connections that are defined for the product name listed in the Web Service Connections.
	Use Existing Zone	Specifies whether to select a predefined zone or any connectable path. If you select this option, the system selects paths within the range of the existing active Zone setting. If you do not select this option, the system selects connectable paths regardless of the existing Zone setting.
	Number of Hops Restriction	Determines whether the service will fail if there is no path that matched the specified collection range.
	Maximum Number of Hops	When using the Number of Hops Restriction option, specify the collection range by the number of hops.

Navigation pane	Settings pane	Description
Zone Settings	Update Zone Configurations	Specify True to enable the modify zone settings functionality.
	Use Existing Zone Aliases	Specify True to use predefined zone aliases regardless of the naming conventions the user specifies. If you specify False, the system selects zone aliases that follow the naming conventions. In either case, if there are no existing zone aliases, the system creates new zone aliases that follow the naming conventions.
	Update Current Active Zone Configuration	Specify True to add a zone to the active zone configuration.
	Zone Configurations to Update	To add a zone to a zone configuration other than the active configuration, specify the name of the zone configuration in which to add the zone.
	Script for Zone Naming	Specify the naming convention script that determines the zone name for the path.
	Script for Host Zone Alias Naming	Specify the naming convention script that determines the zone alias name for the host port.
	Script for Storage Zone Alias Naming	Specify the zone information.

Create Online Migration Pairs for Multiple Hosts: Service details

This service automatically submits a Create Online Migration Pair service task for each specified host. After the auto-submitted tasks are complete, you must submit the Migrate Data for Online Migration Pair service for each task to complete the migration.

When using this template, be aware of the following:

- The automated run of Create Online Migration Pair tasks used by this service is only supported only when Source Selection is Select Hosts. Since this service does not support volume selection, Select Volumes is not displayed in the Edit Service window.
- When multiple hosts are specified in this service, they are always divided into one-host per one-task format, and Create Online Migration Pair is run. If you want to run Create Online Migration Pair on multiple hosts at once, such as multiple hosts in a cluster configuration or multiple hosts to which the same volume has been allocated, you must select multiple hosts and submit the Create Online Migration Pair service, instead of using this service.
- When you select multiple hosts in this service, the Create Online Migration Pair service will be automatically submitted by the number of hosts selected, so the selected number of hosts must be the upper limit or less of multiple runs of Create Online Migration Pair, Migrate Data for Online Migration Pair, and Clean up for Online Migration Pair tasks. A maximum of 25 hosts can be selected for execution. However, if N multiple task runs have already been performed for Create Online Migration Pair, Migrate Data for Online Migration Pair, and Clean up for Online Migration Pair, the maximum number of hosts that can be specified for this service is $25 - N$. If you do not meet the requirements for multiple runs, the maximum number of hosts that can be specified in this service is 1.

See [Running multiple tasks \(on page 160\)](#) for more information.

- While the Create Online Migration Pairs for Multiple Hosts service task is running, do not edit the auto-created Create Online Migration Pair service whose name starts with "[Auto-registered Service for Create Online Migration Pair]". Since this service automatically edits the Create Online Migration Pair service, it is possible that the automatic run of the Create Online Migration Pair task might fail or run with incorrect input parameters if it is manually edited during that time.
- When running multiple tasks by the automatic run of Create Online Migration Pair tasks using this service, not all tasks are run automatically simultaneously, but each task is run sequentially after a few minutes.
- By default, this service automatically enables the host mode option "88. Port Consolidation" for the target host groups when the migration is performed. This lets you specify the same port on the target storage system even if there are multiple source storage systems for the same server. In v10.9.3 or later, you can disable this function by unchecking the "Set Host Mode Option 88 to Host Groups automatically" option.
- If the Use Diskless Quorum option is enabled and the task fails and one of the following conditions are met, the automatically created Diskless Quorum might remain. In this case, check the Quorum ID shown in the message and manually delete the Diskless Quorum:
 - KNAE07604-I is not output to the task log. This message is output for the source and target storage systems respectively.
 - KNAE07607-I is output to the task log.

Software and setup prerequisites

For software and setup prerequisites, see [Service template prerequisites \(on page 126\)](#).

Edit service settings

The following table lists the Edit service settings for the Create Online Migration Pair for Multiple Host service template.

Navigation pane	Settings pane	Description
Source Settings	Source Selection	Specify the source resource as hosts.
	Source Storage Management Connection	Specify the source storage management connection for selecting migration source hosts.
	Source Hosts Filter	Use the filters to display only the source hosts that match the specified criteria.
	Join Host Filters By	Use the "and" and the "or" operators to join multiple filters.
	Source Host Filter (Rows/ Page)	Use the filter to display only the specified number of source hosts.
	Source Host Filter (Current Page)	Use the filter to display only the specified page number of the rows per page number of source hosts.
	Source Hosts	Specify the source hosts. If you select a host to which the clone copy pair volume is attached, confirm that the volume is not the secondary volume of the clone copy pair.
	Source Configuration Manager Connection	Specify the source Configuration Manager connection for migration.
	Source Volume Filter (Resource Group)	Use the filters to display only the source volumes that belong to the resource group.
	Resource Group Name	Select the resource group to filter.
Target Settings	Target Configuration Manager Connection	Specify the target Configuration Manager connection for migration.
	Target Storage System	Specify the target storage system for migration.

Navigation pane	Settings pane	Description
		<p>In the "Compression Acceleration" column, "unavailable" is displayed in the following cases:</p> <ul style="list-style-type: none"> ▪ The migration target storage system does not have the required settings to enable Compression Acceleration. ▪ The migration target storage system is a storage model that does not support enabling Compression Acceleration. <p>If "available" is displayed, Compression Acceleration will be automatically enabled when the capacity saving function is enabled. If "unavailable" is displayed, Compression Acceleration will be automatically disabled when the capacity saving function is enabled.</p>
	Target Resource Group	Specify the target resource group.
	Target Pool	Specify the target pool.
	LDEV ID range starts from	Search for undefined LDEV IDs and allocate target volumes in order from the specified physical LDEV ID. If a physical LDEV ID is not specified, volumes with the same LDEV ID are allocated first.
	LDEV ID range ends at	Specify the last LDEV ID in the LDEV ID range. If the last LDEV ID is not specified, LDEV IDs are used up to the storage system maximum.
	Resource Group for preferential use with LDEV IDs	Specify the resource group to use first when searching for available physical LDEV IDs. If there are not enough available LDEV IDs in the resource group with the specified option, LDEV IDs in the resource group with the unspecified option are also used.

Navigation pane	Settings pane	Description
	Storage Port Mappings	Specify mappings for the source and target storage ports. Based on the mappings, the system configures the I/O path between the host and the target storage ports.
	Source Storage Port	Select a source storage port from the list of registered ports.
	Target Storage Ports	Select one or more target storage ports from the list of registered ports.
	Capacity Saving Settings for Target Volumes	<p>Specify how to apply Capacity Saving settings to target volumes.</p> <p>If "Same as source volumes" is specified, the settings will be applied in the same way as the Capacity Saving settings for source volumes.</p> <p>If "Specify Capacity Saving settings" is specified, the settings selected in the following properties will be applied.</p> <p>If you select the storage system with "Compression Acceleration" available in the "Target Storage System", then Compression Acceleration is enabled when the capacity saving function is enabled. If you select a storage system where "Compression Acceleration" is unavailable, then Compression Acceleration is disabled.</p>
	Select Capacity Saving Function	Specify the Capacity Saving Function for the target volumes. Refer to your storage system product documentation for the optimal setting.
	Select Capacity Saving Mode	Specify the Capacity Saving Mode for the target volumes. Refer to your storage system product documentation for the optimal setting.

Navigation pane	Settings pane	Description
	Set Capacity Saving	<p>Specify when to apply Capacity Saving settings to the target volumes.</p> <p>If "Before migration" is specified, the settings are applied before copying from the source volumes to the target volumes. In this case, Capacity Saving is in effect from the start of migration, but the time required for migration increases.</p> <p>If "After migration" is specified, the settings are applied after copying from the source volumes to the target volumes is complete. In this case, the migration time will not increase, and Capacity Saving will begin after the migration is complete.</p>
Replication Settings	Copy Pace	Specify the copy speed. Increasing the value increases the copy speed.
	Path Group ID Selection	Specify whether to manually select the path group ID.
	Path Group ID	Specify the path group ID.
	Use Diskless Quorum	Specify whether to use automatic diskless quorum creation. If selected, a common diskless quorum is created for each generated task of the Create Online Migration Pair service.
	Quorum Disk	Specify the quorum disk.
	Run Zero Page Reclaim	Specify whether to run zero page reclaim when the online migration is completed.
Email Settings	Send email notification when the migration target volume path allocation is complete.	Specify whether to send an email notification when the migration target volume path allocation is complete. This enables you to confirm the path allocation listed in the email, then bring it online.
	To:	Specify the primary (To) email notification addresses.

Navigation pane	Settings pane	Description
	Cc:	Specify additional Cc email notification addresses.
	Bcc:	Specify additional Bcc email notification addresses.
	Subject:	Specify the email subject.
	Notification mail body	Specify the text of the email body.
Migration Settings	Delete the Host Group	Select the check box to delete the host group.
	Delete the Volume	Select the check box to delete the volume.
	Storage System Lock Wait Time (seconds)	Specify the lock waiting time upper limit when acquiring the storage lock while changing the configuration.
	Set Host Mode Option 88 to Host Groups automatically	Select the checkbox to set Host Mode Option 88 to Host Groups automatically.
	Add Migration Progress to Notes	Specify whether to automatically add the migration progress to Notes of the Create Online Migration Pair task. If you enable this feature, create the Migrate Data for Online Migration Pair and Clean up Online Migration Pair services in the same service group as the Create Online Migration Pairs for Multiple Hosts service.
Fabric Settings	Use Fabric Settings	Specify True to enable fabric information collection.
	Target Fabrics	Specify the fabric name. Separate multiple values by commas. If omitted, all fabrics defined as FOS_PrimarySwitch or DCNM in Connections will be used.
	Fabric Connection Type	Specify the fabric type, either FOS_PrimarySwitch or DCNM to filter the Category in Connections.

Navigation pane	Settings pane	Description
	Connections	Specify the connection defined in the Web Service Connections on the Administration tab. If this value is omitted, the system uses all connections that are defined for the product name listed in the Web Service Connections.
	Use Existing Zone	Specifies whether to select a predefined zone or any connectable path. If you select this option, the system selects paths within the range of the existing active Zone setting. If you do not select this option, the system selects connectable paths regardless of the existing Zone setting.
	Number of Hops Restriction	Determines whether the service will fail if there is no path that matched the specified collection range.
	Maximum Number of Hops	When using the Number of Hops Restriction option, specify the collection range by the number of hops.
Zone Settings	Update Zone Configurations	Specify True to enable the modify zone settings functionality.
	Use Existing Zone Aliases	Specify True to use predefined zone aliases regardless of the naming conventions the user specifies. If you specify False, the system selects zone aliases that follow the naming conventions. In either case, if there are no existing zone aliases, the system creates new zone aliases that follow the naming conventions.
	Update Current Active Zone Configuration	Specify True to add a zone to the active zone configuration.
	Zone Configurations to Update	To add a zone to a zone configuration other than the active configuration, specify the name of the zone configuration in which to add the zone.

Navigation pane	Settings pane	Description
	Script for Zone Naming	Specify the naming convention script that determines the zone name for the path.
	Script for Host Zone Alias Naming	Specify the naming convention script that determines the zone alias name for the host port.
	Script for Storage Zone Alias Naming	Specify the zone information.
Auto-registration Task Settings	Automatically Set the Task Name	Select to set the task name automatically for auto-registered tasks.
	Task Name	Specify the task name for auto-registered tasks.
	Mark the Tasks as "To Do"	Select to mark the auto-registered tasks as To Do.

Submit service settings

The following table lists the Submit service settings for the Create Online Migration Pair for Multiple Host service template.

Navigation pane	Settings pane	Description
Source Settings	Source Selection	Specify the source resource as hosts.
	Source Storage Management Connection	Specify the source storage management connection for selecting migration source hosts.
	Source Hosts Filter	Use the filters to display only the source hosts that match the specified criteria.
	Join Host Filters By	Use the "and" and the "or" operators to join multiple filters.
	Source Host Filter (Rows/ Page)	Use the filter to display only the specified number of source hosts.
	Source Host Filter (Current Page)	Use the filter to display only the specified page number of the rows per page number of source hosts.

Navigation pane	Settings pane	Description
	Source Hosts	Specify the source hosts. If you select a host to which the clone copy pair volume is attached, confirm that the volume is not the secondary volume of the clone copy pair.
	Source Configuration Manager Connection	Specify the source Configuration Manager connection for migration.
	Source Volume Filter (Resource Group)	Use the filters to display only the source volumes that belong to the resource group.
	Resource Group Name	Select the resource group to filter.
Target Settings	Target Configuration Manager Connection	Specify the target Configuration Manager connection for migration.
	Target Storage System	Specify the target storage system for migration. In the "Compression Acceleration" column, "unavailable" is displayed in the following cases: <ul style="list-style-type: none"> ▪ The migration target storage system does not have the required settings to enable Compression Acceleration. ▪ The migration target storage system is a storage model that does not support enabling Compression Acceleration. If "available" is displayed, Compression Acceleration will be automatically enabled when the capacity saving function is enabled. If "unavailable" is displayed, Compression Acceleration will be automatically disabled when the capacity saving function is enabled.
	Target Resource Group	Specify the target resource group.
	Target Pool	Specify the target pool.

Navigation pane	Settings pane	Description
	LDEV ID range starts from	Search for undefined LDEV IDs and allocate target volumes in order from the specified physical LDEV ID. If a physical LDEV ID is not specified, volumes with the same LDEV ID are allocated first.
	LDEV ID range ends at	Specify the last LDEV ID in the LDEV ID range. If the last LDEV ID is not specified, LDEV IDs are used up to the storage system maximum.
	Resource Group for preferential use with LDEV IDs	Specify the resource group to use first when searching for available physical LDEV IDs. If there are not enough available LDEV IDs in the resource group with the specified option, LDEV IDs in the resource group with the unspecified option are also used.
	Storage Port Mappings	Specify mappings for the source and target storage ports. Based on the mappings, the system configures the I/O path between the host and the target storage ports.
	Source Storage Port	Select a source storage port from the list of registered ports.
	Target Storage Ports	Select one or more target storage ports from the list of registered ports.
	Capacity Saving Settings for Target Volumes	Specify how to apply Capacity Saving settings to target volumes. If "Same as source volumes" is specified, the settings will be applied in the same way as the Capacity Saving settings for source volumes. If "Specify Capacity Saving settings" is specified, the settings selected in the following properties will be applied.

Navigation pane	Settings pane	Description
		If you select the storage system with "Compression Acceleration" available in the "Target Storage System", then Compression Acceleration is enabled when the capacity saving function is enabled. If you select a storage system where "Compression Acceleration" is unavailable, then Compression Acceleration is disabled.
	Select Capacity Saving Function	Specify the Capacity Saving Function for the target volumes. Refer to your storage system product documentation for the optimal setting.
	Select Capacity Saving Mode	Specify the Capacity Saving Mode for the target volumes. Refer to your storage system product documentation for the optimal setting.
	Set Capacity Saving	Specify when to apply Capacity Saving settings to the target volumes. If "Before migration" is specified, the settings are applied before copying from the source volumes to the target volumes. In this case, Capacity Saving is in effect from the start of migration, but the time required for migration increases. If "After migration" is specified, the settings are applied after copying from the source volumes to the target volumes is complete. In this case, the migration time will not increase, and Capacity Saving will begin after the migration is complete.
Replication Settings	Copy Pace	Specify the copy speed. Increasing the value increases the copy speed.
	Path Group ID Selection	Specify whether to manually select the path group ID.
	Path Group ID	Specify the path group ID.

Navigation pane	Settings pane	Description
	Use Diskless Quorum	Specify whether to use automatic diskless quorum creation. If selected, a common diskless quorum is created for each generated task of the Create Online Migration Pair service.
	Quorum Disk	Specify the quorum disk.
	Run Zero Page Reclaim	Specify whether to run zero page reclaim when the online migration is completed.
Email Settings	Send email notification when the migration target volume path allocation is complete.	Specify whether to send an email notification when the migration target volume path allocation is complete. This enables you to confirm the path allocation listed in the email, then bring it online.
	To:	Specify the primary (To) email notification addresses.
	Cc:	Specify additional Cc email notification addresses.
	Bcc:	Specify additional Bcc email notification addresses.
	Subject:	Specify the email subject.
	Notification mail body	Specify the text of the email body.
Migration Settings	Delete the Host Group	Select the check box to delete the host group.
	Delete the Volume	Select the check box to delete the volume.
	Storage System Lock Wait Time (seconds)	Specify the lock waiting time upper limit when acquiring the storage lock while changing the configuration.
	Set Host Mode Option 88 to Host Groups automatically	Select the checkbox to set Host Mode Option 88 to Host Groups automatically.

Navigation pane	Settings pane	Description
	Add Migration Progress to Notes	Specify whether to automatically add the migration progress to Notes of the Create Online Migration Pair task. If you enable this feature, create the Migrate Data for Online Migration Pair and Clean up Online Migration Pair services in the same service group as the Create Online Migration Pairs for Multiple Hosts service.
Fabric Settings	Use Fabric Settings	Specify True to enable fabric information collection.
	Target Fabrics	Specify the fabric name. Separate multiple values by commas. If omitted, all fabrics defined as FOS_PrimarySwitch or DCNM in Connections will be used.
	Fabric Connection Type	Specify the fabric type, either FOS_PrimarySwitch or DCNM to filter the Category in Connections.
	Connections	Specify the connection defined in the Web Service Connections on the Administration tab. If this value is omitted, the system uses all connections that are defined for the product name listed in the Web Service Connections.
	Use Existing Zone	Specifies whether to select a predefined zone or any connectable path. If you select this option, the system selects paths within the range of the existing active Zone setting. If you do not select this option, the system selects connectable paths regardless of the existing Zone setting.
	Number of Hops Restriction	Determines whether the service will fail if there is no path that matched the specified collection range.
	Maximum Number of Hops	When using the Number of Hops Restriction option, specify the collection range by the number of hops.

Navigation pane	Settings pane	Description
Zone Settings	Update Zone Configurations	Specify True to enable the modify zone settings functionality.
	Use Existing Zone Aliases	Specify True to use predefined zone aliases regardless of the naming conventions the user specifies. If you specify False, the system selects zone aliases that follow the naming conventions. In either case, if there are no existing zone aliases, the system creates new zone aliases that follow the naming conventions.
	Update Current Active Zone Configuration	Specify True to add a zone to the active zone configuration.
	Zone Configurations to Update	To add a zone to a zone configuration other than the active configuration, specify the name of the zone configuration in which to add the zone.
	Script for Zone Naming	Specify the naming convention script that determines the zone name for the path.
	Script for Host Zone Alias Naming	Specify the naming convention script that determines the zone alias name for the host port.
	Script for Storage Zone Alias Naming	Specify the zone information.
Auto-registration Task Settings	Automatically Set the Task Name	Select to set the task name automatically for auto-registered tasks.
	Task Name	Specify the task name for auto-registered tasks.
	Mark the Tasks as "To Do"	Select to mark the auto-registered tasks as To Do.

Migrate Data for Online Migration Pair: Service details

The Migrate Data for Online Migration Pair service template runs from the swap of copy pairs to the deletion of source volumes for online host migration through Configuration Manager. Before submitting this service, the Create Online Migration Pair service must be completed.

**Note:**

- The Online Migration with Configuration Manager service template that existed in v10.5.1 or earlier has been split into two service templates: Create Online Migration Pair and Migrate Data for Online Migration Pair. We recommend that you use the new service templates.
- Tasks that do not meet the following conditions cannot be migrated:
 - Template key name: Copy_NDM_CM
 - Template vendor ID: com.hitachi.software.dna.cts
 - Template version: The service template version (VV.RR in VV.RR.SS) of the Create Online Migration Pair task must be the same as the Migrate Data for Online Migration Pair service template.
 - Status: Completed or Failed
 - Task status: The following conditions must be met:
 - The Create Online Migration Pair task has reached the “Wait for Copy Completion” step placed under the “Create Online Migration Pair” step.
 - Other Migrate Data for Online Migration Pair tasks or Clean up Online Migration Pair tasks that target the same Create Online Migration Pair task have not been started.
- Only non-archived Create Online Migration Pair tasks can be migrated. With the default settings, the Create Online Migration Pair task is archived 7 days after the task ends. Change this setting if you need to migrate after 7 days.
- You must run the Migrate Data for Online Migration Pair task with the same permissions as the user who ran the Create Online Migration Pair task.
- The target storage systems must be registered in the same API Configuration Manager that was used when running the Create Online Migration Pair task and the API Configuration Manager must be registered in Web Service Connections.
- If the Use Diskless Quorum option is enabled and the task fails and the following condition is met, the automatically created Diskless Quorum might remain. In this case, check the Quorum ID shown in the Results tab and manually delete the Diskless Quorum:
 - KNAE07604-I is not output to the task log. This message is output for the source and target storage systems respectively.

Software and setup prerequisites

For software and setup prerequisites, see [Service template prerequisites \(on page 126\)](#).

Edit service settings

The following table lists the Edit service settings for the Migrate Data for Online Migration Pair service template.

Navigation pane	Settings pane	Description
Target Selection	Target Task Filter (Rows/ Page)	Specify the number of tasks to display on the window. The default is 1000.
	Target Task Filter (Current Page)	Specify the number of pages of tasks to display. The default is 1.
	Target Task	Select the target task.
Migration Settings	Storage System Lock Wait Time (seconds)	Specify the lock waiting time upper limit when acquiring the storage lock while changing the configuration. The default is 604800.
	Response Timeout (minutes)	Specify the maximum wait time for the response in minutes. The default is 20160.

Submit service settings

The following table lists the Submit service settings for the Migrate Data for Online Migration Pair service template.

Navigation pane	Settings pane	Description
Target Selection	Target Task Filter (Rows/ Page)	Specify the number of tasks to display on the window. The default is 1000.
	Target Task Filter (Current Page)	Specify the number of pages of tasks to display. The default is 1.
	Target Task	Select the target task.

Clean up Online Migration Pair: Service details

The Clean up Online Migration Pair service template enables you to clean up the resources created by the Create Online Migration Pair task.

**Note:**

- Tasks that do not meet the following conditions cannot be cleaned up
 - Template key name: Copy_NDM_CM
 - Template vendor ID: com.hitachi.software.dna.cts
 - Template version: The service template version (VV.RR in VV.RR.SS) of the Create Online Migration Pair task must be the same as the Clean up Online Migration Pair service template.
 - Status: Completed or Failed
 - Task status: The Migrate Data for Online Migration Pair task that targets the Create Online Migration Pair task has not been started.
- Only non-archived Create Online Migration Pair tasks can be cleaned up. With the default settings, the Create Online Migration Pair task is archived 7 days after the task ends. Change this setting if you need to clean up after 7 days.
- You must run the Clean up Online Migration Pair task with the same permissions as the user who ran the Create Online Migration Pair task.
- The target storage systems must be registered in the same API Configuration Manager that was used when running the Create Online Migration Pair task and the API Configuration Manager must be registered in Web Service Connections.
- To clean up a Create Online Migration Pair task with errors, you must remove the cause of the error before running the Clean up Online Migration Pair task.
- If the target resources configuration changes before the Clean up Online Migration Pair task is run, it might not be able to delete them. If there are resources that could not be deleted, a warning message is displayed. Confirm the message and then delete the target resources manually.
- If the Clean up Online Migration Pair task ends in an error, you must remove the cause of the error, and then resubmit the task.
- The task will fail with a KNAE07538-E message if the pair status becomes abnormal due to a storage system failure after the Create Online Migration Pair task has successfully completed. In this case, perform recovery according to the following procedure.
 1. Recover from the failure by referring to "Disaster recovery of global-active device" in the Global-Active Device User Guide for each storage system.
 2. After recovering according to the Global-Active Device User Guide, refresh the storage system information in Ops Center API Configuration Manager from the Ops Center Automator server.
 3. Submit the Clean up Online Migration Pair service again.

Software and setup prerequisites

For software and setup prerequisites, see [Service template prerequisites \(on page 126\)](#).

Edit Service settings

The following table lists the Edit Service settings for the Clean up Online Migration Pair service template.

Navigation pane	Settings pane	Description
Target Selection	Target Task Filter (Rows/ Page)	Specify the number of tasks displayed on the window at one time.
	Target Task Filter (Current Page)	Specify the page number of tasks displayed in the window.
	Target Task	Select the clean up target task.
Cleanup Settings	Storage System Lock Wait Time (seconds)	Specify the lock waiting time upper limit when acquiring the storage lock while changing the configuration.
	Response Timeout (minutes)	Specify the maximum wait time for the response in minutes.

Submit Service settings

The following table lists the Submit Service settings for the Clean up Online Migration Pair service template.

Navigation pane	Settings pane	Description
Target Selection	Target Task Filter (Rows/ Page)	Specify the number of tasks displayed on the window at one time.
	Target Task Filter (Current Page)	Specify the page number of tasks displayed in the window.
	Target Task	Select the clean up target task.

ServiceNow ticketing service templates

You can combine the Ops Center Automator ServiceNow ticketing templates to create different types of services for processing ServiceNow workflows that include running an Ops Center Automator automation service.

You can watch a [video](#) about using Ops Center Automator with ServiceNow. The interface might be slightly different, but the steps are the same.



Note: For information about the ServiceNow Workflow Integration package that has an XML file containing the update set required to integrate an Ops Center Automator service into a ServiceNow workflow, see [ServiceNow workflow integration \(on page 113\)](#).

The following Ops Center Automator ServiceNow ticketing service templates are provided with the software and are preconfigured:

Call ServiceNow Table API

Makes a call to the ServiceNow Table API.

Create ServiceNow Incident Ticket

Creates a new ServiceNow incident ticket.

Update ServiceNow Incident Ticket

Updates a ServiceNow incident ticket.

Retrieve ServiceNow Incident Tickets

Retrieves a single ServiceNow incident ticket or a group of incident tickets.

Default ports

Port number	Use
443	Secure communication from Ops Center Automator to ServiceNow.

Call ServiceNow Table API: Service details

This service enables calls to the ServiceNow Table API.

The following service template details apply to the Call ServiceNow Table API service template.

This service template does not have an associated service.

Software and setup prerequisites

For software and setup prerequisites, see [Service template prerequisites \(on page 126\)](#).

Edit Service settings

The following table lists the Edit Service settings for the Call ServiceNow Table API service template.

Navigation pane	Settings pane	Description
ServiceNow	ServiceNow Connection Name	Specify the ServiceNow connection name registered in the Web Service Connection. This setting is required.
	Table Name	Specify the table name to execute the API. This setting is required.
	HTTP Method	Specify the method, which is POST, PUT, or GET. This setting is required.
	sys_id	Specify the system ID (sys_id).
	Query Parameters	Specify the query parameter in a form concatenated with an encoded character string.
	Request Body	Specify the request body in JSON format.

Submit Service settings

The following table lists the submit Service settings for the Call ServiceNow Table API service template.

Navigation pane	Settings pane	Description
ServiceNow	ServiceNow Connection Name	Specify the ServiceNow connection name registered in the Web Service Connection. This setting is required.
	Table Name	Specify the table name to execute the API. This setting is required.
	HTTP Method	Specify the method, which is POST, PUT, or GET. This setting is required.

Navigation pane	Settings pane	Description
	sys_id	Specify the system ID (sys_id).
	Query Parameters	Specify the query parameter in a form concatenated with an encoded character string.
	Request Body	Specify the request body in JSON format.

Create ServiceNow Incident Ticket: Service details

This service enables you to create an incident ticket.

The following service template details apply to the Create ServiceNow Incident Ticket service template.

This service template does not have an associated service.

Software and setup prerequisites

For software and setup prerequisites, see [Service template prerequisites \(on page 126\)](#).

Edit Service settings

The following table lists the Edit Service settings for the Create ServiceNow Incident Ticket service template.

Navigation pane	Settings pane	Description
ServiceNow	ServiceNow Connection Name	Specify the ServiceNow connection name registered in the Web Service Connection. This setting is required.
Request Section	active	Active
	activity_due	Activity due
	additional_assignee_list	Additional assignee list
	approval	Approval
	approval_history	Approval history
	approval_set	Approval set
	assigned_to	Assigned to

Navigation pane	Settings pane	Description
	assignment_group	Assignment group
	business_duration	Business duration
	business_service	Business service
	business_stc	Business resolve time
	calendar_duration	Duration
	calendar_stc	Resolve time
	caller_id	Caller
	category	Category
	child_incidents	Child incidents
	closed_at	Closed
	closed_by	Closed by
	cmdb_ci	Configuration item
	company	Company
	contact_type	Contact type
	correlation_display	Correlation display
	correlation_id	Correlation ID
	delivery_plan	Delivery plan
	delivery_task	Delivery task
	description	Description
	due_date	Due date
	escalation	Escalation
	expected_start	Expected start
	follow_up	Follow up
	group_list	Group list
	hold_reason	On hold reason
	impact	Impact
	incident_state	Incident state
	location	Location

Navigation pane	Settings pane	Description
	made_sla	Made SLA
	notify	Notify
	number	Number
	opened_at	Opened
	opened_by	Opened by
	order	Order
	parent	Parent
	parent_incident	Parent incident
	priority	Priority
	reassignment_count	Reassignment count
	reopen_count	Reopen count
	reopened_by	Last reopened by
	reopened_time	Reopened time
	route_reason	Route reason
	service_offering	Service offering
	severity	Severity
	short_description	Short description
	sla_due	SLA due
	state	State
	subcategory	Subcategory
	sys_class_name	Task type
	sys_created_by	Created by
	sys_created_on	Created
	sys_domain	Domain
	sys_domain_path	Domain path
	sys_mod_count	Updates
	sys_updated_by	Updated by
	sys_updated_on	Updated

Navigation pane	Settings pane	Description
	task_effective_number	Effective number
	time_worked	Time worked
	universal_request	Universal request
	upon_approval	Upon approval
	upon_reject	Upon reject
	urgency	Urgency
	user_input	User input
	work_end	Work end
	work_start	Work start
Note Section	comments	Additional comments
	comments_and_work_notes	Comments and work notes
	watch_list	Watch list
	work_notes	Work notes
	work_notes_list	Work notes list
Related Record Section	caused_by	Caused by Change
	problem_id	Problem
	rfc	Change Request
Resolution Information Section	close_code	Resolution code
	close_notes	Resolution notes
	knowledge	Knowledge
	resolved_at	Resolved
	resolved_by	Resolved by
Query Parameters	sysparm_display_value	<p>Whether to return the actual values of field or return the display values.</p> <ul style="list-style-type: none"> ▪ false: Return only the actual values. ▪ true: Return only the display values. ▪ all: Return both.

Navigation pane	Settings pane	Description
	sysparm_exclude_reference_link	Whether to add detailed information of the reference field. <ul style="list-style-type: none"> false: Do not add true: Add
	sysparm_fields	Specify the field names you want to return in the response in comma-separated values. The specified value will be encoded before sending a Table API request.
	sysparm_input_display_value	Whether to set the input values as the display value or as the actual value. <ul style="list-style-type: none"> false: Actual value true: Display value
	sysparm_suppress_auto_sys_field	Whether to suppress auto generation of System field. <ul style="list-style-type: none"> false: Do not suppress true: Suppress
	sysparm_view	A parameter that renders the response according to the specified UI view. The specified value will be encoded before sending a Table API request. This is overridden by sysparm_fields.

Submit Service settings

The following table lists the submit Service settings for the Create ServiceNow Incident Ticket service template.

Navigation pane	Settings pane	Description
ServiceNow	ServiceNow Connection Name	Specify the ServiceNow connection name registered in the Web Service Connection. This setting is required.
Request Section	active	Active
	activity_due	Activity due
	additional_assignee_list	Additional assignee list
	approval	Approval
	approval_history	Approval history
	approval_set	Approval set
	assigned_to	Assigned to
	assignment_group	Assignment group
	business_duration	Business duration
	business_service	Business service
	business_stc	Business resolve time
	calendar_duration	Duration
	calendar_stc	Resolve time
	caller_id	Caller
	category	Category
	child_incidents	Child incidents
	closed_at	Closed
	closed_by	Closed by
	cmdb_ci	Configuration item
	company	Company
	contact_type	Contact type
	correlation_display	Correlation display
	correlation_id	Correlation ID
	delivery_plan	Delivery plan

Navigation pane	Settings pane	Description
	delivery_task	Delivery task
	description	Description
	due_date	Due date
	escalation	Escalation
	expected_start	Expected start
	follow_up	Follow up
	group_list	Group list
	hold_reason	On hold reason
	impact	Impact
	incident_state	Incident state
	location	Location
	made_sla	Made SLA
	notify	Notify
	number	Number
	opened_at	Opened
	opened_by	Opened by
	order	Order
	parent	Parent
	parent_incident	Parent incident
	priority	Priority
	reassignment_count	Reassignment count
	reopen_count	Reopen count
	reopened_by	Last reopened by
	reopened_time	Reopened time
	route_reason	Route reason
	service_offering	Service offering
	severity	Severity
	short_description	Short description

Navigation pane	Settings pane	Description
	sla_due	SLA due
	state	State
	subcategory	Subcategory
	sys_class_name	Task type
	sys_created_by	Created by
	sys_created_on	Created
	sys_domain	Domain
	sys_domain_path	Domain path
	sys_mod_count	Updates
	sys_updated_by	Updated by
	sys_updated_on	Updated
	task_effective_number	Effective number
	time_worked	Time worked
	universal_request	Universal request
	upon_approval	Upon approval
	upon_reject	Upon reject
	urgency	Urgency
	user_input	User input
	work_end	Work end
	work_start	Work start
Note Section	comments	Additional comments
	comments_and_work_notes	Comments and work notes
	watch_list	Watch list
	work_notes	Work notes
	work_notes_list	Work notes list
Related Record Section	caused_by	Caused by Change
	problem_id	Problem
	rfc	Change Request

Navigation pane	Settings pane	Description
Resolution Information Section	close_code	Resolution code
	close_notes	Resolution notes
	knowledge	Knowledge
	resolved_at	Resolved
	resolved_by	Resolved by
Query Parameters	sysparm_display_value	Whether to return the actual values of field or return the display values. <ul style="list-style-type: none"> ▪ false: Return only the actual values. ▪ true: Return only the display values. ▪ all: Return both.
	sysparm_exclude_reference_link	Whether to add detailed information of the reference field. <ul style="list-style-type: none"> ▪ false: Do not add ▪ true: Add
	sysparm_fields	Specify the field names you want to return in the response in comma-separated values. The specified value will be encoded before sending a Table API request.
	sysparm_input_display_value	Whether to set the input values as the display value or as the actual value. <ul style="list-style-type: none"> ▪ false: Actual value ▪ true: Display value
	sysparm_suppress_auto_sys_field	Whether to suppress auto generation of System field. <ul style="list-style-type: none"> ▪ false: Do not suppress ▪ true: Suppress

Navigation pane	Settings pane	Description
	sysparm_view	<p>A parameter that renders the response according to the specified UI view.</p> <p>The specified value will be encoded before sending a Table API request.</p> <p>This is overridden by sysparm_fields.</p>

Update ServiceNow Incident Ticket: Service details

This service enables you to update an incident ticket.

The following service template details apply to the Update ServiceNow Incident Ticket service template.

This service template does not have an associated service.

Software and setup prerequisites

For software and setup prerequisites, see [Service template prerequisites \(on page 126\)](#).

Edit Service settings

The following table lists the Edit Service settings for the Update ServiceNow Incident Ticket service template.

Navigation pane	Settings pane	Description
ServiceNow	ServiceNow Connection Name	<p>Specify the ServiceNow connection name registered in the Web Service Connection.</p> <p>This setting is required.</p>
	sys_id	<p>Specify the system ID (sys_id) of the ticket.</p> <p>This setting is required.</p>
Request Section	active	Active
	activity_due	Activity due
	additional_assignee_list	Additional assignee list
	approval	Approval

Navigation pane	Settings pane	Description
	approval_history	Approval history
	approval_set	Approval set
	assigned_to	Assigned to
	assignment_group	Assignment group
	business_duration	Business duration
	business_service	Business service
	business_stc	Business resolve time
	calendar_duration	Duration
	calendar_stc	Resolve time
	caller_id	Caller
	category	Category
	child_incidents	Child incidents
	closed_at	Closed
	closed_by	Closed by
	cmdb_ci	Configuration item
	company	Company
	contact_type	Contact type
	correlation_display	Correlation display
	correlation_id	Correlation ID
	delivery_plan	Delivery plan
	delivery_task	Delivery task
	description	Description
	due_date	Due date
	escalation	Escalation
	expected_start	Expected start
	follow_up	Follow up
	group_list	Group list
	hold_reason	On hold reason

Navigation pane	Settings pane	Description
	impact	Impact
	incident_state	Incident state
	location	Location
	made_sla	Made SLA
	notify	Notify
	number	Number
	opened_at	Opened
	opened_by	Opened by
	order	Order
	parent	Parent
	parent_incident	Parent incident
	priority	Priority
	reassignment_count	Reassignment count
	reopen_count	Reopen count
	reopened_by	Last reopened by
	reopened_time	Reopened time
	route_reason	Route reason
	service_offering	Service offering
	severity	Severity
	short_description	Short description
	sla_due	SLA due
	state	State
	subcategory	Subcategory
	sys_class_name	Task type
	sys_created_by	Created by
	sys_created_on	Created
	sys_domain	Domain
	sys_domain_path	Domain path

Navigation pane	Settings pane	Description
	sys_mod_count	Updates
	sys_updated_by	Updated by
	sys_updated_on	Updated
	task_effective_number	Effective number
	time_worked	Time worked
	universal_request	Universal request
	upon_approval	Upon approval
	upon_reject	Upon reject
	urgency	Urgency
	user_input	User input
	work_end	Work end
	work_start	Work start
Note Section	comments	Additional comments
	comments_and_work_notes	Comments and work notes
	watch_list	Watch list
	work_notes	Work notes
	work_notes_list	Work notes list
Related Record Section	caused_by	Caused by Change
	problem_id	Problem
	rfc	Change Request
Resolution Information Section	close_code	Resolution code
	close_notes	Resolution notes
	knowledge	Knowledge
	resolved_at	Resolved
	resolved_by	Resolved by

Navigation pane	Settings pane	Description
Query Parameters	sysparm_display_value	Whether to return the actual values of the field or return the display values. <ul style="list-style-type: none"> ▪ false: Return only the actual values. ▪ true: Return only the display values. ▪ all: Return both.
	sysparm_exclude_reference_link	Whether to add detailed information for the reference field. <ul style="list-style-type: none"> ▪ false: Do not add ▪ true: Add
	sysparm_fields	Specify the field names you want to return in the response in comma-separated values. The specified value will be encoded before sending a Table API request.
	sysparm_input_display_value	Whether to set the input values as the display value or as the actual value. <ul style="list-style-type: none"> ▪ false: Actual value ▪ true: Display value
	sysparm_suppress_auto_sys_field	Whether to suppress auto-generation of the System field. <ul style="list-style-type: none"> ▪ false: Do not suppress ▪ true: Suppress
	sysparm_view	A parameter that renders the response according to the specified UI view. The specified value will be encoded before sending a Table API request. This is overridden by sysparm_fields.

Submit Service settings

The following table lists the submit Service settings for the Update ServiceNow Incident Ticket service template.

Navigation pane	Settings pane	Description
ServiceNow	ServiceNow Connection Name	Specify the ServiceNow connection name registered in the Web Service Connection. This setting is required.
	sys_id	Specify the system ID (sys_id) of the ticket. This setting is required.
Request Section	active	Active
	activity_due	Activity due
	additional_assignee_list	Additional assignee list
	approval	Approval
	approval_history	Approval history
	approval_set	Approval set
	assigned_to	Assigned to
	assignment_group	Assignment group
	business_duration	Business duration
	business_service	Business service
	business_stc	Business resolve time
	calendar_duration	Duration
	calendar_stc	Resolve time
	caller_id	Caller
	category	Category
	child_incidents	Child incidents
	closed_at	Closed
	closed_by	Closed by
	cmdb_ci	Configuration item

Navigation pane	Settings pane	Description
	company	Company
	contact_type	Contact type
	correlation_display	Correlation display
	correlation_id	Correlation ID
	delivery_plan	Delivery plan
	delivery_task	Delivery task
	description	Description
	due_date	Due date
	escalation	Escalation
	expected_start	Expected start
	follow_up	Follow up
	group_list	Group list
	hold_reason	On hold reason
	impact	Impact
	incident_state	Incident state
	location	Location
	made_sla	Made SLA
	notify	Notify
	number	Number
	opened_at	Opened
	opened_by	Opened by
	order	Order
	parent	Parent
	parent_incident	Parent incident
	priority	Priority
	reassignment_count	Reassignment count
	reopen_count	Reopen count
	reopened_by	Last reopened by

Navigation pane	Settings pane	Description
	reopened_time	Reopened time
	route_reason	Route reason
	service_offering	Service offering
	severity	Severity
	short_description	Short description
	sla_due	SLA due
	state	State
	subcategory	Subcategory
	sys_class_name	Task type
	sys_created_by	Created by
	sys_created_on	Created
	sys_domain	Domain
	sys_domain_path	Domain path
	sys_mod_count	Updates
	sys_updated_by	Updated by
	sys_updated_on	Updated
	task_effective_number	Effective number
	time_worked	Time worked
	universal_request	Universal request
	upon_approval	Upon approval
	upon_reject	Upon reject
	urgency	Urgency
	user_input	User input
	work_end	Work end
	work_start	Work start
Note Section	comments	Additional comments
	comments_and_work_notes	Comments and work notes
	watch_list	Watch list

Navigation pane	Settings pane	Description
	work_notes	Work notes
	work_notes_list	Work notes list
Related Record Section	caused_by	Caused by Change
	problem_id	Problem
	rfc	Change Request
Resolution Information Section	close_code	Resolution code
	close_notes	Resolution notes
	knowledge	Knowledge
	resolved_at	Resolved
	resolved_by	Resolved by
Query Parameters	sysparm_display_value	Whether to return the actual values of the field or return the display values. <ul style="list-style-type: none"> ▪ false: Return only the actual values. ▪ true: Return only the display values. ▪ all: Return both.
	sysparm_exclude_reference_link	Whether to add detailed information for the reference field. <ul style="list-style-type: none"> ▪ false: Do not add ▪ true: Add
	sysparm_fields	Specify the field names you want to return in the response in comma-separated values. The specified value will be encoded before sending a Table API request.

Navigation pane	Settings pane	Description
	sysparm_input_display_value	Whether to set the input values as the display value or as the actual value. <ul style="list-style-type: none"> false: Actual value true: Display value
	sysparm_suppress_auto_sys_field	Whether to suppress auto-generation of the System field. <ul style="list-style-type: none"> false: Do not suppress true: Suppress
	sysparm_view	A parameter that renders the response according to the specified UI view. The specified value will be encoded before sending a Table API request. This is overridden by sysparm_fields.

Retrieve ServiceNow Incident Tickets: Service details

This service enables you to retrieve an incident ticket or a group of incident tickets.

The following service template details apply to the Retrieve ServiceNow Incident Tickets service template.

This service template does not have an associated service.

Software and setup prerequisites

For software and setup prerequisites, see [Service template prerequisites \(on page 126\)](#).

Edit Service settings

The following table lists the Edit Service settings for the Retrieve ServiceNow Incident Tickets service template.

Navigation pane	Settings pane	Description
ServiceNow	ServiceNow Connection Name	Specify the ServiceNow connection name registered in the Web Service Connection. This setting is required.
	sys_id	Specify the system ID (sys_id) of the ticket to retrieve information for a single ticket.
Query Parameters	sysparm_display_value	Whether to return the actual values of the field or return the display values. <ul style="list-style-type: none"> ▪ false: Return only the actual values. ▪ true: Return only the display values. ▪ all: Return both.
	sysparm_exclude_reference_link	Whether to add detailed information for the reference field. <ul style="list-style-type: none"> ▪ false: Do not add ▪ true: Add
	sysparm_fields	Specify the field names you want to return in the response in comma-separated values. The specified value will be encoded before sending a Table API request.
	sysparm_view	A parameter that renders the response according to the specified UI view. The specified value will be encoded before sending a Table API request. This is overridden by sysparm_fields.
	sysparm_query	Specify the query string that filters the response data.

Navigation pane	Settings pane	Description
		The specified value will be encoded before sending a Table API request. (Only for multiple information acquisition)
	sysparm_suppress_pagination_header	Whether to suppress the pagination header. (Only when acquiring multiple pieces of information.) <ul style="list-style-type: none"> ▪ false: Do not suppress ▪ true: Suppress
	sysparm_limit	Specify the maximum number of results returned per page. (default: 10,000) (Only when acquiring multiple pieces of information.)
	sysparm_query_category	Specify the name of the query category (read replica category) to use for queries. The specified value will be encoded before sending a Table API request. (Only when acquiring multiple pieces of information.)
	sysparm_query_no_domain	Whether to restrict the record search to only the domains for which the logged in user is configured. <ul style="list-style-type: none"> ▪ false: Restrict ▪ true: Do not restrict If this setting is omitted, the default is false.

Navigation pane	Settings pane	Description
	sysparm_no_count	Whether to include the number of search results in the results. <ul style="list-style-type: none"> ▪ false: Do not include ▪ true: Include

Submit Service settings

The following table lists the submit Service settings for the Retrieve ServiceNow Incident Tickets service template.

Navigation pane	Settings pane	Description
ServiceNow	ServiceNow Connection Name	Specify the ServiceNow connection name registered in the Web Service Connection. This setting is required.
	sys_id	Specify the system ID (sys_id) of the ticket to retrieve information for a single ticket.
Query Parameters	sysparm_display_value	Whether to return the actual values of the field or return the display values. <ul style="list-style-type: none"> ▪ false: Return only the actual values. ▪ true: Return only the display values. ▪ all: Return both.
	sysparm_exclude_reference_link	Whether to add detailed information for the reference field. <ul style="list-style-type: none"> ▪ false: Do not add ▪ true: Add

Navigation pane	Settings pane	Description
	sysparm_fields	Specify the field names you want to return in the response in comma-separated values. The specified value will be encoded before sending a Table API request.
	sysparm_view	A parameter that renders the response according to the specified UI view. The specified value will be encoded before sending a Table API request. This is overridden by sysparm_fields.
	sysparm_query	Specify the query string that filters the response data. The specified value will be encoded before sending a Table API request. (Only for multiple information acquisition)
	sysparm_suppress_pagination_header	Whether to suppress the pagination header. (Only when acquiring multiple pieces of information.) <ul style="list-style-type: none"> ▪ false: Do not suppress ▪ true: Suppress
	sysparm_limit	Specify the maximum number of results returned per page. (default: 10,000) (Only when acquiring multiple pieces of information.)
	sysparm_query_category	Specify the name of the query category (read replica category) to use for queries.

Navigation pane	Settings pane	Description
		The specified value will be encoded before sending a Table API request. (Only when acquiring multiple pieces of information.)
	sysparm_query_no_domain	Whether to restrict the record search to only the domains for which the logged in user is configured. <ul style="list-style-type: none"> ▪ false: Restrict ▪ true: Do not restrict If this setting is omitted, the default is false.
	sysparm_no_count	Whether to include the number of search results in the results. <ul style="list-style-type: none"> ▪ false: Do not include ▪ true: Include

Task Settings for services

All preconfigured services include the following task settings.

Settings pane		Description
Task Name		Enter a task name (required.)
Description		Enter a description if needed.
Schedule Type Not all options are available for every service.	Immediate	Run the task immediately when it is submitted.
	Scheduled	Run the task on a schedule by selecting the start time.

Appendix C: Additional service templates

Ops Center Automator has the following types of additional templates:

- Service templates that are provided with the product, but are not imported by default and do not have an associated service.
- Service templates that are not provided with the product. You download these templates first, then import them. These templates do not have an associated service.

For the additional service templates which are not imported by default, you can import them by accessing the server through a remote connection and then using the Ops Center Automator UI.

vSphere service templates

The following is a list of the additional Ops Center Automator vSphere templates, which are not imported by default. However, you can import them by accessing the server through a remote connection and then using the Ops Center Automator UI. See [Importing service templates \(on page 495\)](#) for more information.



Note: To install PowerCLI, a vSphere templates prerequisite, see the *Release Notes* and *User's Guide* of each version available on the following website:

<https://code.vmware.com/web/tool/11.5.0/vmware-powercli>

Modify Virtual Machine Configuration

Modifies the virtual server configuration in the VMware vSphere environment.

Clone Virtual Machine

Creates a clone of a virtual server in the VMware vSphere environment.

Delete Cloned Virtual Machine

Deletes a clone of a virtual server in the VMware vSphere environment.

Migrate Virtual Machine

Migrates multiple virtual servers in a VMware vSphere environment.

Stop Virtual Machine

Stops multiple virtual servers in a VMware vSphere environment.

Start Virtual Machine

Starts multiple virtual servers in a VMware vSphere environment.

Restart Virtual Machine

Restarts multiple virtual servers in a VMware vSphere environment.

Create Snapshot of Virtual Machine

Creates a snapshot of the virtual machine for updating the status of a virtual server.

Add Virtual Disk to Virtual Machine

Adds a disk to a virtual server in a VMware vSphere environment.

Remove Virtual Disk from Virtual Machine

Deletes a virtual disk in a VMware vSphere environment.

Delete Virtual Machine

Delete Virtual Machine

Deploy and Setup OS on Virtual Machine

Creates a virtual server in a VMware vSphere environment.

Get List of Virtual Machines from VMware vSphere

Acquires a list of VMware vSphere virtual servers.

Script execution through the vCenter server

In a VMware vSphere environment, transmits the specified non-interactive script file from the target server to the guest OS on the virtual server, and then runs the script file on the guest OS. Scripts can be deleted after execution.

Modify Virtual Machine Configuration: Service details

This service template modifies a VM configuration in a VMware vSphere environment.

The general steps for using this service template to modify a Virtual Machine configuration are as follows:

1. Obtain the power status of the virtual server to clone.
2. Make sure the power status of the virtual server is OFF.
 - a. If the power status is not OFF, you can use the User-Response Wait Plug-in to confirm whether to turn the power OFF.
 - b. Users with Modify permission can set the e-mail destination/message text, timeout, and display contents through the User-Response Wait Plug-in.
 - c. If the user selects "Shutdown" in the UI of the User-Response Wait Plug-in, the service template shuts down the virtual server.
 - d. If the user selects "Cancel" or if a timeout occurs while waiting for a user response, the server ends abnormally without completing the process on the virtual server.
3. Modify the resources (number of CPUs, memory capacity) of the virtual server.



Note: The maximum number of characters that you can specify for the virtual server name property (vmware.vmName) is 60.

Service Definition Properties

The following table lists the properties shown in the **Edit Service** window for the Modify Virtual Machine Configuration service template.

Property Key	Property Name	Description	Required or optional
vmware.targetHost	Host name of VMware vCenter control server	Specify the host name or IP address of the server (a server with vSphere PowerCLI installed) that will be used to control VMware vCenter. You cannot specify an IPv6 address.	R
vmware.vCenterServerName	VMware vCenter server name	Specify the host name or IP address of the VMware vCenter server. You cannot specify an IPv6 address.	R
vmware.userName	User name for VMware vCenter Server connection	Specify the user name to use when connecting to the VMware vCenter server.	R
vmware.password	Password for VMware vCenter Server connection	Specify the password to use when connecting to the VMware vCenter server.	R
vmware.portNumber	Port number for VMware vCenter Server connection	Specify the port number to use when connecting to the VMware vCenter server (specifically, the port number of the VMware vCenter server's Web service). If you omit this property, the default value of the VMware vCenter server applies.	O

Property Key	Property Name	Description	Required or optional
vmware.protocol	Protocol for VMware vCenter Server connection	Specify the protocol to use when connecting to the VMware vCenter server.	R
UserResponsePlugin.toAddress	TO addresses	Specify the email addresses to enter in the TO field of notification emails sent when the service is waiting for a user response. Separate multiple addresses with commas. Example: mailA,mailB	O
UserResponsePlugin.ccAddress	CC addresses	Specify the email addresses to enter in the CC field of notification emails sent when the service is waiting for a user response. Separate multiple addresses with commas. Example: mailA,mailB	O
UserResponsePlugin.bccAddress	BCC addresses	Specify the email addresses to enter in the BCC field of notification emails sent when the service is waiting for a user response. Separate multiple addresses with commas. Example: mailA,mailB	O
UserResponsePlugin.mailSubject	Subject line	Specify the subject line of notification emails sent when the service is waiting for a user response.	O

Property Key	Property Name	Description	Required or optional
UserResponsePlugin .mailBody	Email text	Specify the body text of notification emails sent when the service is waiting for a user response.	O
UserResponsePlugin .encodeType	Encoding	Specify the encoding of notification emails sent when the service is waiting for a user response. The encodings you can specify are us-ascii, iso-2022-jp, shift_jis, euc-jp, and utf-8. If you omit this property, utf-8 is set.	O
UserResponsePlugin .dialogText	Additional dialog box text	Enter additional text to appear in the response input dialog box, in text or HTML format. Supported HTML tags are anchor tags, bold tags, break tags, font tags, italics tags, and underline tags.	O
UserResponsePlugin .responseTimeOut	Response timeout time (minutes)	Specify how long (in minutes) the service waits for a user response before timing out. In the event of a response timeout, the service will end abnormally.	R

Property Key	Property Name	Description	Required or optional
vmware.checkPowerStateCount	Power status check count	Specifies the number of times to verify the power status when confirming that the virtual server is stopped. In combination with the power status verification interval, this determines the maximum wait time.	R
vmware.checkPowerStateInterval	Power status check interval	Specifies the interval in seconds for verifying the power status when confirming that the virtual server is stopped.	R

Service Definition and Submit Service Properties

The following table lists the properties shown in the **Service Definition** and **Submit Service** windows for the Modify Virtual Machine Configuration service template.

Property Key	Property Name	Description	Required or optional
vmware.vmName	Virtual server name	Specify the name of the virtual server. This name is used to represent the virtual server in VMware vCenter server. It is not used as a host name by the OS.	R

Property Key	Property Name	Description	Required or optional
vmware.cpuNum	Number of CPUs	Specify amount of CPU set to a virtual server. The number must be a number of virtual processors in VMware vCenter Server 4.1 or earlier, or virtual sockets in VMware vCenter Server 5.0 or later. Specify at least "number of CPUs" or "amount of memory".	O
vmware.memoryMB	Memory size (MB)	Specify the amount of memory (in MB) to assign to the virtual server. You must specify either CPUs or memory size property.	O
vmware.cpuSharesLevel	CPU shares level	Specifies the relative priority of CPU resources between virtual servers that have the same parent.	O
vmware.cpuReservationMHz	CPU reservation (MHz)	Specifies, in megahertz, the CPU resources that are reserved by the virtual server.	O

Property Key	Property Name	Description	Required or optional
vmware.cpuLimitMHz	CPU limit (MHz)	Specifies, in megahertz, the maximum CPU resources that are to be used by the virtual server. If a value less than 100 MHz is specified, task execution ends abnormally. However, specifying -1 cancels this restriction.	O
vmware.memSharesLevel	Memory shares level	Specifies the relative priority of memory resources between virtual servers that have the same parent.	O
vmware.memReservationMB	Memory reservation (MB)	Specifies, in megabyte, the Memory resources that are reserved by the virtual server.	O
vmware.memLimitMB	Memory limit (MB)	Specifies, in megabyte, the maximum memory resources that are to be used by the virtual server. If a value less than 100 MB is specified, task execution ends abnormally. However, specifying -1 cancels this restriction.	O
vmware.diskSharesLevel	Disk shares level	Specifies the relative priority of virtual servers for storage I/O resources.	O

Property Key	Property Name	Description	Required or optional
vmware.vHardDiskName	Virtual disk name	Specifies virtual disk where shares level is changed. Virtual disk is display name in VMware vCenter Server. To specify multiple virtual disks, specify by separating with a comma.	O



Note: Although some of the properties in the tables indicate that they can be omitted, they might be required when used in conjunction with some other property setting as indicated in the descriptions.

Prerequisites

The following conditions must be met:

- VMware vSphere ESXi (or VMware ESX Server) is managed by VMware vCenter Server.
- Each virtual server name is unique among the vCenter servers.
- VMwareTools is installed on the target virtual server.

Server requirements

To use this service template, the following servers are needed:

- vCenter server: This is a server on which VMware vCenter Server is installed.
- vCenter control server: This is a server on which VMware vSphere PowerCLI is installed.
- Virtual server: This is a virtual server managed by the vCenter server and VMware vSphere ESX.

Software requirements

One of the following is required:

- VMware vSphere PowerCLI 6.3 Release1, 6.0 Release3, 6.0 Release1
- VMware PowerCLI 6.5 Release1
- VMware PowerCLI 6.5.1, 6.5.4
- VMware PowerCLI 10.1.0, 10.1.1

Usage guidelines

- Do not run multiple instances of this service on the same virtual server.
- If you specify HTML tags in `UserResponseplugin.dialogText`, the permitted tags and attributes are the same as those for the User-Response Wait Plug-in.
- For VMware vCenter Server 5.0 or later, set the number of cores per socket to 1 on the target virtual server. If the number of CPUs is changed for a virtual server on which the number of cores per socket is set to a value other than 1, the virtual server might not start.

Clone Virtual Machine: Service details

This service template creates a clone of a virtual server in the VMware vSphere environment.

The general steps for using this service template to clone a virtual machine are as follows:

1. Obtain the power status of the virtual server to clone.
2. Make sure the power status of the virtual server is OFF.
 - a. If the power status is not OFF, you can use the User-Response Wait Plug-in to confirm whether to turn the power OFF.
 - b. Users with Modify permission can set the e-mail destination/message text, timeout, and display contents through the User-Response Wait Plug-in.
 - c. You can use "Shutdown" for the wait-for-user response, to shut the virtual server down. Before shutting down the virtual server, the system waits the number of seconds specified in the power status confirmation frequency property `vmware.checkPowerStateInterval` to confirm that the power has been turned OFF and repeats that until it is confirmed or repeats according to the number of times specified in the power status confirmation retries property `vmware.checkPowerStateCount`. Adjust the value of each property according to the environment.
 - d. If the user selects "Cancel" or if a timeout occurs while waiting for a user response, the server ends abnormally without operating the virtual server.
3. The virtual server to clone is used to create a clone.
 - a. When creating a clone, a set of parameters (ESX server, resource pool, data store, and virtual disk format) can be specified.
 - b. If no resource pool is specified, the clone is created directly under the destination ESX server where the clone is created.
 - c. The maximum length of the virtual server name property `vmware.vmName` and clone name property (`vmware.cloneName`) is 60 characters.

Service Definition Properties

The following table lists the properties shown in the **Service Definition** window for the Clone Virtual Machine service template.

Property Key	Property Name	Description	Required or optional
vmware.targetHost	Host name of VMware vCenter control server	Specify the host name or IP address of the server (a server with vSphere PowerCLI installed) that will be used to control VMware vCenter. You cannot specify an IPv6 address.	R
vmware.vCenterServerName	VMware vCenter server name	Specify the host name or IP address of the VMware vCenter server. You cannot specify an IPv6 address.	R
vmware.userName	User name for VMware vCenter Server connection	Specify the user name to use when connecting to the VMware vCenter server.	R
vmware.password	Password for VMware vCenter Server connection	Specify the password to use when connecting to the VMware vCenter server.	R
vmware.portNumber	Port number for VMware vCenter Server connection	Specify the port number to use when connecting to the VMware vCenter server (specifically, the port number of the VMware vCenter server's Web service). If you omit this property, the default value of the VMware vCenter server applies.	O

Property Key	Property Name	Description	Required or optional
vmware.protocol	Protocol for VMware vCenter Server connection	Specify the protocol to use when connecting to the VMware vCenter server.	R
UserResponsePlugin.toAddress	TO addresses	Specify the email addresses to enter in the TO field of notification emails sent when the service is waiting for a user response. Separate multiple addresses with commas. Example: mailA,mailB	O
UserResponsePlugin.ccAddress	CC addresses	Specify the email addresses to enter in the CC field of notification emails sent when the service is waiting for a user response. Separate multiple addresses with commas. Example: mailA,mailB	O
UserResponsePlugin.bccAddress	BCC addresses	Specify the email addresses to enter in the BCC field of notification emails sent when the service is waiting for a user response. Separate multiple addresses with commas. Example: mailA,mailB	O
UserResponsePlugin.mailSubject	Subject line	Specify the subject line of notification emails sent when the service is waiting for a user response.	O

Property Key	Property Name	Description	Required or optional
UserResponsePlugin .mailBody	Email text	Specify the body text of notification emails sent when the service is waiting for a user response.	O
UserResponsePlugin .encodeType	Encoding	Specify the encoding of notification emails sent when the service is waiting for a user response. The encodings you can specify are us-ascii, iso-2022-jp, shift_jis, euc-jp, and utf-8. If you omit this property, utf-8 is set.	O
UserResponsePlugin .dialogText	Additional dialog box text	Enter additional text to appear in the response input dialog box, in text or HTML format. Supported HTML tags are anchor tags, bold tags, break tags, font tags, italics tags, and underline tags.	O
UserResponsePlugin .responseTimeOut	Response timeout time (minutes)	Specify how long (in minutes) the service waits for a user response before timing out. In the event of a response timeout, the service will end abnormally.	R

Property Key	Property Name	Description	Required or optional
vmware.checkPowerStateCount	Number of power status confirmation retries	Specify the number of times the service tries to verify the power status to confirm that the virtual server has started. The maximum wait time is determined by this property and the property that defines the power status verification interval.	R
vmware.checkPowerStateInterval	Frequency of power status confirmation retries	Specify the interval at which the service tries to acquire the power status to confirm that the virtual server has started.	R

Service Definition and Submit Service Properties

The following table lists the properties visible in the **Service Definition** and **Submit Service** windows for the Clone Virtual Machine service template.

Property Key	Property Name	Description	Required or optional
vmware.cloneName	Clone name	Specifies the name of a clone. (This is the display name of a clone under VMware vCenter Server. It is not a host name under the OS.)	R

Property Key	Property Name	Description	Required or optional
vmware.vmName	Virtual server name	Specify the name of a virtual server as the cloning source. (This is the display name of a virtual server under VMware vCenter Server. It is not a host name under the OS.)	R
vmware.vmHostName	ESX server name	Specify the ESX server name visible in the Hosts and Clusters inventory view managed by VMware vCenter Server, which serves as the cloning destination.	R
vmware.dataStoreName	Datastore name	Specify the name of a data store as the cloning destination.	R
vmware.resourcePoolName	Resource pool name	Specify a resource pool or cluster as the cloning destination.	O
vmware.diskFormat	Virtual disk format	Specifies format of the virtual disk of the clone to be created. Specify "Default" when the format is the same as the virtual disk of the virtual server of the clone source, "Thin" when committing it on demand, or "Thick" when committing it in full size.	R



Note: Although some of the properties in the tables indicate that they can be omitted, they might be required when used in conjunction with some other property setting as indicated in the descriptions.

Prerequisites

The following conditions must be met:

- VMware vSphere ESXi (or VMware ESX Server) is managed by VMware vCenter Server.
- No duplicate clone names can be under the same vCenter. No duplicate clone name is the same as an existing virtual server name.
- No duplicate data store name can be under the same vCenter.
- VMware Tools is installed in the virtual server to be cloned.
- The version of VMware vSphere ESXi (or VMware ESX Server) managing the virtual server to be cloned matches that of VMware vSphere ESXi (or VMware ESX Server) managing the cloning destination.

Server requirements

To use this service template, the following servers are needed:

- vCenter server: This is a server on which VMware vCenter Server is installed.
- vCenter control server: This is a server on which VMware vSphere PowerCLI is installed.
- Virtual server to be cloned: Virtual server managed by vCenter server or VMware vSphere ESXi (or VMware ESX Server).
- Clone: Clone of the virtual server to be cloned. The clone name is the name of the virtual server clone.

Software requirements

One of the following is required:

- VMware vSphere PowerCLI 6.3 Release1, 6.0 Release3, 6.0 Release1
- VMware PowerCLI 6.5 Release1
- VMware PowerCLI 6.5.1, 6.5.4
- VMware PowerCLI 10.1.0, 10.1.1

Usage guidelines

- Do not run multiple instances of this service on the same virtual server at the same time.
- Do not use a different service to operate the virtual server source or destination of cloning during cloning. Also, do not operate the virtual servers directly from the vCenter server. The service can fail.
- HTML tags can be specified in the additional information property `UserResponseplugin.dialogText` in the window for entering a response. The property accepts the same tags and attributes as those available in the User-Response Wait Plug-in. For details, see "User-Response Wait Plug-in" in the *Hitachi Ops Center Automator Service Builder User Guide*.

- vAPP cannot be specified as the destination of cloning.
- Do not start the new clone. To start a created clone, you must delete or restore the cloned virtual server.

Delete Cloned Virtual Machine: Service details

This service template deletes a clone in the VMware vSphere environment.

The general steps for using this service template to delete a cloned Virtual Machine are as follows:

1. Obtain the power status of the clone.
2. Confirm that the power status of the clone is OFF.
 - a. If the power status is OFF, the service proceeds to the next step.
 - b. If the power status is not OFF, the service ends abnormally.
3. Delete the clone.

The maximum length of the virtual server name property `vmware.vmName` and clone name property `vmware.cloneName` is 60 characters.

Service Definition Properties

The following table lists the properties visible in the **Service Definition** window for the Delete Cloned Virtual Machine service template.

Property Key	Property Name	Description	Required or optional
vmware.targetHost	Host name of VMware vCenter control server	Specify the host name or IP address of the server (a server with vSphere PowerCLI installed) that will be used to control VMware vCenter. You cannot specify an IPv6 address.	R
vmware.vCenterServerName	VMware vCenter server name	Specify the host name or IP address of the VMware vCenter server. You cannot specify an IPv6 address.	R

Property Key	Property Name	Description	Required or optional
vmware.userName	User name for VMware vCenter Server connection	Specify the user name to use when connecting to the VMware vCenter server.	R
vmware.password	Password for VMware vCenter Server connection	Specify the password to use when connecting to the VMware vCenter server.	R
vmware.portNumber	Port number for VMware vCenter Server connection	Specify the port number to use when connecting to the VMware vCenter server (specifically, the port number of the VMware vCenter server's Web service). If you omit this property, the default value of the VMware vCenter server applies.	O
vmware.protocol	Protocol for VMware vCenter Server connection	Specify the protocol to use when connecting to the VMware vCenter server.	R

Service Definition and Submit Service Properties

The following table lists the properties visible in the **Service Definition** and **Submit Service** windows for the Delete Cloned Virtual Machine service template.

Property Key	Property Name	Description	Required or optional
vmware.vmName	Name of a virtual server as the cloning source	Specifies name of virtual server of clone source (display name of virtual server in VMware vCenter Server, not host name in OS). Specify this name for confirmation to prevent clone source from being mistakenly deleted. This virtual server is not deleted.	R
vmware.cloneName	Name of the clone to be deleted	Specify the name of the clone to be deleted. (This is the display name of a clone under VMware vCenter Server. It is not a host name under the OS.)	R



Note: Although some of the properties in the tables indicate that they can be omitted, they might be required when used in conjunction with some other property setting as indicated in the descriptions.

Prerequisites

The following conditions must be met:

- VMware vSphere ESXi (or VMware ESX Server) is managed by VMware vCenter Server.
- No name duplication of the clone to be deleted can be in the same vCenter instance. Also, there is no virtual server name that is the same the clone name.
- VMware Tools is installed in the virtual servers to be operated.

Server requirements

To use this service template, the following servers are needed:

- vCenter server: Server on which VMware vCenter Server is installed.
- vCenter control server: Server on which VMware vSphere PowerCLI is installed.

- Virtual server cloned: Virtual server managed by vCenter server or VMware vSphere ESXi (or VMware ESX Server).
- Clone: Clone of the virtual server cloned. The clone name is the name of the virtual server clone.

Software requirements

One of the following is required:

- VMware vSphere PowerCLI 6.3 Release1, 6.0 Release3, 6.0 Release1
- VMware PowerCLI 6.5 Release1
- VMware PowerCLI 6.5.1, 6.5.4
- VMware PowerCLI 10.1.0, 10.1.1

Usage guidelines

- Do not run this service for multiple instances of the same clone at the same time.
- If virtual server of clone source is already deleted or the name is unknown, use the virtual server deletion service to delete the clone.

Migrate Virtual Machine: Service details

Service Definition Properties

The following table lists the properties visible in the **Service Definition** window for the Migrate Virtual Machine service template.

Property Key	Property Name	Description	Required or optional
vmware.targetHost	Host name of VMware vCenter control server	Specify the host name or IP address of the server (a server with vSphere PowerCLI installed) that will be used to control VMware vCenter. You cannot specify an IPv6 address.	R
vmware.vCenterServerName	VMware vCenter server name	Specify the host name or IP address of the VMware vCenter server. You cannot specify an IPv6 address.	R

Property Key	Property Name	Description	Required or optional
vmware.userName	User name for VMware vCenter Server connection	Specify the user name to use when connecting to the VMware vCenter server.	R
vmware.password	Password for VMware vCenter Server connection	Specify the password to use when connecting to the VMware vCenter server.	R
vmware.portNumber	Port number for VMware vCenter Server connection	Specify the port number to use when connecting to the VMware vCenter server (specifically, the port number of the VMware vCenter server's Web service). If you omit this property, the default value of the VMware vCenter server applies.	O
vmware.protocol	Protocol for VMware vCenter Server connection	Specify the protocol to use when connecting to the VMware vCenter server.	R

Service Definition and Submit Service Properties

The following table lists the properties visible in the **Service Definition** and **Submit Service** windows for the Migrate Virtual Machine service template.

Property Key	Property Name	Description	Required or optional
vmware.foreachVmName	Virtual server name(s)	Specify the virtual server name or names. Specify server names as they appear in VMware vCenter Server, not by host name. Separate multiple virtual servers with commas. The maximum number of virtual servers you can specify is 99.	R
vmware.destinationName	Virtual server destination	Specify the name of the destination VMware vSphere ESXi (or VMware ESX Server), resource pool, cluster, or folder.	R



Note: Although some of the properties in the tables indicate that they can be omitted, they might be required when used in conjunction with some other property setting as indicated in the descriptions.

Prerequisites

The following conditions must be met:

- VMware vSphere ESXi (or VMware ESX Server) is managed by VMware vCenter Server.
- Each virtual server name is unique among the vCenter servers.
- The firewall of the target virtual server is set to allow responses to ICMP (ECHO).
- VMwareTools is installed on the target virtual server.

Server requirements

To use this service template, the following servers are needed:

- vCenter server: This is a server on which VMware vCenter Server is installed.
- vCenter control server: This is a server on which VMware vSphere PowerCLI is installed.
- Virtual server: This is a virtual server managed by the vCenter server and VMware vSphere ESX.



Note: If a target virtual server's power is on, the plug-in performs hot migration (migration with the power on); if the target virtual server's power is off, the plug-in performs cold migration (migration with the power off).

Software requirements

One of the following is required:

- VMware vSphere PowerCLI 6.3 Release1, 6.0 Release3, 6.0 Release1
- VMware PowerCLI 6.5 Release1
- VMware PowerCLI 6.5.1, 6.5.4
- VMware PowerCLI 10.1.0, 10.1.1

Usage guidelines

- When you move multiple virtual servers, the target VMware vSphere ESXi (or VMware ESX Server) might experience a high workload.
- The same virtualization software product must be used for the source and the target.
- The virtualization software that runs the virtual servers must be running.
- The virtual server name, cluster name, vApp name, and resource pool name must be unique within the vCenter Server.



Note: The same name cannot be assigned to more than one virtual server, cluster, vApp, and resource pool although their types are different, such as a duplication of a cluster name and a vApp name or a duplication of a cluster name and a resource pool name.

- If a cluster is specified as a virtual server's migration target, the virtual server being migrated must exist in the resource pool under the specified target cluster.
- If a folder is specified as a virtual server's migration target, there must be at least one virtual server under the specified target folder.
- In an environment that uses a VMware vCenter Server version earlier than 4.1 U2, if an inactive virtual machine is migrated to an ESX in a different data center, an error might occur, in which case task execution fails.

Stop Virtual Machine: Service details

This service template turns off the power to multiple virtual servers in a VMware vSphere environment.

The general steps for using this service template to stop a virtual machine are as follows:

1. The power status of each virtual server is obtained.
2. If a virtual server's power status is on, it is turned off.

The specified group of virtual servers are turned off according to the number of seconds specified through the `vmware.checkPowerStateInterval` property and then verified to determine if the power is off, which it does up to the number of times specified through the `vmware.checkPowerStateCount` property. If the default values are not suitable, specify values that suit your environment.

Service Definition Properties

The following table lists the properties visible in the **Service Definition** window for the Stop Virtual Machine service template.

Property Key	Property Name	Description	Required or optional
vmware.targetHost	Host name of VMware vCenter control server	Specify the host name or IP address of the server (a server with vSphere PowerCLI installed) that will be used to control VMware vCenter. You cannot specify an IPv6 address.	R
vmware.vCenterServerName	VMware vCenter server name	Specify the host name or IP address of the VMware vCenter server. You cannot specify an IPv6 address.	R
vmware.userName	User name for VMware vCenter Server connection	Specify the user name to use when connecting to the VMware vCenter server.	R
vmware.password	Password for VMware vCenter Server connection	Specify the password to use when connecting to the VMware vCenter server.	R

Property Key	Property Name	Description	Required or optional
vmware.portNumber	Port number for VMware vCenter Server connection	Specify the port number to use when connecting to the VMware vCenter server (specifically, the port number of the VMware vCenter server's Web service). If you omit this property, the default value of the VMware vCenter server applies.	O
vmware.protocol	Protocol for VMware vCenter Server connection	Specify the protocol to use when connecting to the VMware vCenter server.	R
vmware.checkPowerStateCount	Power status check count	Specifies the number of times to verify the power status when confirming that the virtual server is stopped. In combination with the power status verification interval, this determines the maximum wait time.	R
vmware.checkPowerStateInterval	Power status check interval	Specifies the interval in seconds for verifying the power status when confirming that the virtual server is stopped.	R

Service Definition and Submit Service Properties

The following table lists the properties visible in the **Service Definition** and **Submit Service** windows for the Stop Virtual Machine service template.

Property Key	Property Name	Description	Required or optional
vmware.foreachVmName	Virtual server name(s)	Specify the virtual server name or names. Specify server names as they appear in VMware vCenter Server, not by host name. Separate multiple virtual servers with commas. The maximum number of virtual servers you can specify is 99.	R



Note: Although some of the properties in the tables indicate that they can be omitted, they might be required when used in conjunction with some other property setting as indicated in the descriptions.

Prerequisites

The following conditions must be met:

- VMware vSphere ESXi (or VMware ESX Server) is managed by VMware vCenter Server.
- Each virtual server name is unique among the vCenter servers.
- VMwareTools is installed on the target virtual server.

Server requirements

To use this service template, the following servers are needed:

- vCenter server: This is a server on which VMware vCenter Server is installed.
- vCenter control server: This is a server on which VMware vSphere PowerCLI is installed.
- Virtual server: This is a virtual server managed by the vCenter server and VMware vSphere ESX.

Software requirements

One of the following is required:

- VMware vSphere PowerCLI 6.3 Release1, 6.0 Release3, 6.0 Release1
- VMware PowerCLI 6.5 Release1
- VMware PowerCLI 6.5.1, 6.5.4
- VMware PowerCLI 10.1.0, 10.1.1

Start Virtual Machine: Service details

This service template turns on power to multiple virtual servers in a VMware vSphere environment.

The general steps for using this service template to start a virtual machine are as follows:

1. The power status of each virtual server is obtained.
2. If a virtual server's power status is off, it is turned on.
3. An ICMP echo request is sent to verify that a virtual server is started.

The specified group of virtual servers are turned off according to the number of seconds specified through the `vmware.checkPowerStateInterval` property and then verified to determine if the power is off, which it does up to the number of times specified through the `vmware.checkPowerStateCount` property. If the default values are not suitable, specify values that suit your environment.

Service Definition Properties

The following table lists the properties visible in the **Service Definition** window for the Start Virtual Machine service template.

Property Key	Property Name	Description	Required or optional
vmware.targetHost	Host name of VMware vCenter control server	Specify the host name or IP address of the server (a server with vSphere PowerCLI installed) that will be used to control VMware vCenter. You cannot specify an IPv6 address.	R
vmware.vCenterServerName	VMware vCenter server name	Specify the host name or IP address of the VMware vCenter server. You cannot specify an IPv6 address.	R
vmware.userName	User name for VMware vCenter Server connection	Specify the user name to use when connecting to the VMware vCenter server.	R

Property Key	Property Name	Description	Required or optional
vmware.password	Password for VMware vCenter Server connection	Specify the password to use when connecting to the VMware vCenter server.	R
vmware.portNumber	Port number for VMware vCenter Server connection	Specify the port number to use when connecting to the VMware vCenter server (specifically, the port number of the VMware vCenter server's Web service). If you omit this property, the default value of the VMware vCenter server applies.	O
vmware.protocol	Protocol for VMware vCenter Server connection	Specify the protocol to use when connecting to the VMware vCenter server.	R
vmware.checkPowerStateCount	Power status check count	Specify the number of times the service tries to verify the power status to confirm that the virtual server has started. The maximum wait time is determined by this property and the property that defines the power status verification interval.	R
vmware.checkPowerStateInterval	Power status check interval	Specify the interval at which the service tries to acquire the power status to confirm that the virtual server has started.	R

Property Key	Property Name	Description	Required or optional
common.icmpEchoTimeout	Timeout period for ICMP echo requests	Specify in milliseconds how long the service waits for a reply to an ICMP echo request sent to confirm startup of a virtual server.	R

Service Definition and Submit Service Properties

The following table lists the properties visible in the **Service Definition** and **Submit Service** windows for the Start Virtual Machine service template.

Property Key	Property Name	Description	Required
vmware.foreachVmName	Virtual server name(s)	Specify the virtual server name or names. Specify server names as they appear in VMware vCenter Server, not by host name. Separate multiple virtual servers with commas. The maximum number of virtual servers you can specify is 99.	R



Note: Although some of the properties in the tables indicate that they can be omitted, they might be required when used in conjunction with some other property setting as indicated in the descriptions.

Prerequisites

The following conditions must be met:

- VMware vSphere ESXi (or VMware ESX Server) is managed by VMware vCenter Server.
- Each virtual server name is unique among the vCenter servers.
- The firewall of the target virtual server is set to allow responses to ICMP (ECHO).
- VMwareTools is installed on the target virtual server.

Server requirements

To use this service template, the following servers are required:

- vCenter server: This is a server on which VMware vCenter Server is installed.
- vCenter control server: This is a server on which VMware vSphere PowerCLI is installed.
- Virtual server: This is a virtual server managed by the vCenter server and VMware vSphere ESX.

Software requirements

One of the following is required:

- VMware vSphere PowerCLI 6.3 Release1, 6.0 Release3, 6.0 Release1
- VMware PowerCLI 6.5 Release1
- VMware PowerCLI 6.5.1, 6.5.4
- VMware PowerCLI 10.1.0, 10.1.1

Usage guidelines

- The VMware vSphere ESXi (or VMware ESX Server) that is to be started cannot be specified. Start the service template on VMware vSphere ESXi (or VMware ESX Server) that contains virtual servers.
- Adjust the ICMP echo timeout value (common.icmpEchoTimeout property) for the local environment.
- Depending on the state of the system environment, the virtual server might successfully start but the network connection verification might fail, possibly causing the task to end abnormally. Verify the task log to see if an error has occurred with the network connection verification (the component "Obtain the IP address of a virtual server" (vsphereGetVMIPaddress) or the component "Send ICMP echo request message" (osSendIcmp)). If an error has occurred in these components, verify whether the virtual server is started.
- If many IP addresses (#1) are set for the NIC of the virtual server, an error might occur in the component "Send ICMP echo request message" and the task might end abnormally. Verify that the total length of the IP addresses set for the NIC is within 1,024 characters.
 #1: You can set the following IP address types. For example, if 64 or less addresses are set for IPv4 only, no problem will occur.
 - IPv4 (maximum length is 16 characters)
 - IPv4 (maximum length is 36 characters)
 - IPv4 and IPv6 set by DHCP

Restart Virtual Machine: Service details

This service template restarts multiple virtual servers in a VMware vSphere environment.

The general steps for using this service template to restart a virtual machine are as follows:

1. The status of a virtual server is obtained.

2. If a virtual server's power status is on, the service template restarts the virtual server. If the virtual server's power status is off, the corresponding virtual server processing results in an error.
3. An ICMP echo request is sent to verify that the virtual server is started.

The specified group of virtual servers are turned off according to the number of seconds specified through the `vmware.checkPowerStateInterval` property and then verified to determine if the power is off, which it does up to the number of times specified through the `vmware.checkPowerStateCount` property. Therefore, the maximum wait time is the product of these two property values times two (in seconds). If the default values are not suitable, specify values that suit your environment.

Service Definition Properties

The following table lists the properties visible in the **Service Definition** window for the Restart Virtual Machine service template.

Property Key	Property Name	Description	Required or optional
vmware.targetHost	Host name of VMware vCenter control server	Specify the host name or IP address of the server (a server with vSphere PowerCLI installed) that will be used to control VMware vCenter. You cannot specify an IPv6 address.	R
vmware.vCenterServerName	VMware vCenter server name	Specify the host name or IP address of the VMware vCenter server. You cannot specify an IPv6 address.	R
vmware.userName	User name for VMware vCenter Server connection	Specify the user name to use when connecting to the VMware vCenter server.	R
vmware.password	Password for VMware vCenter Server connection	Specify the password to use when connecting to the VMware vCenter server.	R

Property Key	Property Name	Description	Required or optional
vmware.portNumber	Port number for VMware vCenter Server connection	Specify the port number to use when connecting to the VMware vCenter server (specifically, the port number of the VMware vCenter server's Web service). If you omit this property, the default value of the VMware vCenter server applies.	O
vmware.protocol	Protocol for VMware vCenter Server connection	Specify the protocol to use when connecting to the VMware vCenter server.	R
vmware.checkPowerStateCount	Power status check count	Specify the number of times the service tries to verify the power status to confirm that the virtual server has stopped and started. The maximum wait time is determined by this property and the property that defines the power status verification interval.	R
vmware.checkPowerStateInterval	Power status check interval	Specifies the interval in seconds for verifying the power status when confirming that the virtual server is stopped or started.	R

Property Key	Property Name	Description	Required or optional
common.icmpEchoTimeout	Timeout period for ICMP echo requests	Specify in milliseconds how long the service waits for a reply to an ICMP echo request sent to confirm startup of a virtual server.	R

Service Definition and Submit Service Properties

The following table lists the properties visible in the **Service Definition** and **Submit Service** windows for the Restart Virtual Machine service template.

Property Key	Property Name	Description	Required or optional
vmware.foreachVmName	Virtual server name(s)	Specify the virtual server name or names. Specify server names as they appear in VMware vCenter Server, not by host name. Separate multiple virtual servers with commas. The maximum number of virtual servers you can specify is 99.	R



Note: Although some of the properties in the tables indicate that they can be omitted, they might be required when used in conjunction with some other property setting as indicated in the descriptions.

Prerequisites

The following conditions must be met:

- VMware vSphere ESXi (or VMware ESX Server) is managed by VMware vCenter Server.
- Each virtual server name is unique among the vCenter servers.
- VMwareTools is installed on the target virtual server.
- The firewall of the target virtual server is set to allow for responses to ICMP (ECHO).

Server requirements

To use this service template, the following servers are needed:

- vCenter server: This is a server on which VMware vCenter Server is installed.
- vCenter control server: This is a server on which VMware vSphere PowerCLI is installed.
- Virtual server: This is a virtual server managed by the vCenter server and VMware vSphere ESX.

Software requirements

One of the following is required:

- VMware vSphere PowerCLI 6.3 Release1, 6.0 Release3, 6.0 Release1
- VMware PowerCLI 6.5 Release1
- VMware PowerCLI 6.5.1, 6.5.4
- VMware PowerCLI 10.1.0, 10.1.1

Usage guidelines

- Adjust the ICMP echo timeout value (common.icmpEchoTimeout property) for the local environment.
- Depending on the state of the system environment, the virtual server might successfully start, but the network connection verification might fail, possibly causing the task to end abnormally. Verify the task log to see if an error has occurred with the network connection verification (the component "Obtain the IP address of a virtual server" (vsphereGetVMIPaddress) or the component "Send ICMP echo request message" (osSendIcmp)). If an error has occurred in these components, verify whether the virtual server is started.
- If many IP addresses (#1) are set for the NIC of the virtual server, an error might occur in the component "Send ICMP echo request message" and the task might end abnormally. Verify that the total length of the IP addresses set for the NIC is within 1,024 characters.
 #1: You can set the following addresses types. For example, if 64 or less addresses are set for IPv4 only, no problem occurs.
 - IPv4 (maximum length is 16 characters)
 - IPv4 (maximum length is 36 characters)
 - IPv4 and IPv6 set by DHCP

Create Snapshot of Virtual Machine: Service details

This service template creates a snapshot of the virtual machine for updating the status of a virtual server.

The general steps for using this service template to create a snapshot of a virtual machine are as follows:

1. A snapshot of the virtual server is created.

2. After creating the snapshot, the wait for the response part of the service is run to wait for the user to complete changes to the status or data of the virtual server. The UI waiting for a response allows the user to select "Commit (to use the change result) or Roll back (to cancel).
3. The snapshot of the virtual server is deleted. If the user selects Commit from the UI waiting for a response, the changes made after creating the snapshot are committed, and the snapshot is deleted. If the user selects Roll back from the UI waiting for a response, the changes made after creating the snapshot are discarded, and the snapshot is deleted. The maximum length of the virtual server name property `vmware.vmName` is 60 characters.

Service Definition Properties

The following table lists the properties visible in the **Service Definition** window for the Create Snapshot of Virtual Machine service template.

Property Key	Property Name	Description	Required or optional
vmware.targetHost	Host name of VMware vCenter control server	Specify the host name or IP address of the server (a server with vSphere PowerCLI installed) that will be used to control VMware vCenter. You cannot specify an IPv6 address.	R
vmware.vCenterServerName	VMware vCenter server name	Specify the host name or IP address of the VMware vCenter server. You cannot specify an IPv6 address.	R
vmware.userName	User name for VMware vCenter Server connection	Specify the user name to use when connecting to the VMware vCenter server.	R
vmware.password	Password for VMware vCenter Server connection	Specify the password to use when connecting to the VMware vCenter server.	R

Property Key	Property Name	Description	Required or optional
vmware.portNumber	Port number for VMware vCenter Server connection	Specify the port number to use when connecting to the VMware vCenter server (specifically, the port number of the VMware vCenter server's Web service). If you omit this property, the default value of the VMware vCenter server applies.	O
vmware.protocol	Protocol for VMware vCenter Server connection	Specify the protocol to use when connecting to the VMware vCenter server.	R
vmware.snapshotName	Snapshot name	Specify the name of the snapshot.	R
UserResponsePlugin.toAddress	TO addresses	Specify the email addresses to enter in the TO field of notification emails sent when the service is waiting for a user response. Separate multiple addresses with commas. Example: mailA,mailB	O
UserResponsePlugin.ccAddress	CC addresses	Specify the email addresses to enter in the CC field of notification emails sent when the service is waiting for a user response. Separate multiple addresses with commas. Example: mailA,mailB	O

Property Key	Property Name	Description	Required or optional
UserResponsePlugin .bccAddress	BCC addresses	Specify the email addresses to enter in the BCC field of notification emails sent when the service is waiting for a user response. Separate multiple addresses with commas. Example: mailA,mailB	O
UserResponsePlugin .mailSubject	Subject line	Specify the subject line of notification emails sent when the service is waiting for a user response.	O
UserResponsePlugin .mailBody	Email text	Specify the body text of notification emails sent when the service is waiting for a user response.	O
UserResponsePlugin .encodeType	Encoding	Specify the encoding of notification emails sent when the service is waiting for a user response. The encodings you can specify are us-ascii, iso-2022-jp, shift_jis, euc-jp, and utf-8. If you omit this property, utf-8 is set.	O
UserResponsePlugin .dialogText	Additional dialog box text	Enter additional text to appear in the response input dialog box, in text or HTML format. Supported HTML tags are anchor tags, bold tags, break tags, font tags, italics tags, and underline tags.	O

Property Key	Property Name	Description	Required or optional
UserResponsePlugin .responseTimeout	Response timeout time (minutes)	Specify how long (in minutes) the service waits for a user response before timing out. In the event of a response timeout, the service will end abnormally.	R

Service Definition and Submit Service Properties

The following table lists the properties visible in the **Service Definition** and **Submit Service** windows for the Create Snapshot of Virtual Machine service template.

Property Key	Property Name	Description	Required or optional
vmware.vmName	Virtual server name	Specify the name of the virtual server. This name is used to represent the virtual server in VMware vCenter server. It is not used as a host name by the OS.	R



Note: Although some of the properties in the tables indicate that they can be omitted, they might be required when used in conjunction with some other property setting as indicated in the descriptions.

Prerequisites

The following conditions must be met:

- VMware vSphere ESXi (or VMware ESX Server) is managed by VMware vCenter Server.
- No duplicate virtual server names can be under the same vCenter.
- No duplicate snapshot names can be in the same virtual server.
- VMware Tools is installed on the target virtual server.
- The pre-change power status of the target virtual server is OFF.

Server requirements

To use this service template, the following servers are needed:

- vCenter server: This is a server on which VMware vCenter Server is installed.
- vCenter control server: This is a server on which VMware vSphere PowerCLI is installed.
- Virtual server: This is a virtual server managed by the vCenter server and VMware vSphere ESX.

Software requirements

One of the following is required:

- VMware vSphere PowerCLI 6.3 Release1, 6.0 Release3, 6.0 Release1
- VMware PowerCLI 6.5 Release1
- VMware PowerCLI 6.5.1, 6.5.4
- VMware PowerCLI 10.1.0, 10.1.1

Usage guidelines

- Do not run this service for multiple instances of the same virtual server at the same time.
- Do not target any virtual servers on which a raw, RDM physical mode or independent disk is set.
- HTML tags can be specified in the additional information property UserResponseplugin.dialogText in the window for entering a response. The property accepts the same tags and attributes as those available in the User-Response Wait Plug-in.
- If an error occurs while running this service, confirm the snapshot name from the task log and verify whether the snapshot is present. If the snapshot remains, commit or discard the snapshot. Do not leave a snapshot created by this service for an extended period time. Before starting the server, apply or discard the snapshot and delete it; not doing so can cause unnecessary data storage capacity use.

Add Virtual Disk to Virtual Machine: Service details

This service template adds disks to multiple virtual servers.

The general steps for using this service template to add a virtual disk to a virtual machine are as follows:

1. The power status of a virtual server is obtained.
2. Verifies that the power status is off.
 - a. If the power status is not off, the service template uses the User-Response Wait Plug-in to determine whether to turn off the power.
 - b. A user with the Modify permission can specify an email destination, email message contents, timeout value, and information to be visible in the window by the User-Response Wait Plug-in.
 - c. If the user selects Shutdown in the UI of the User-Response Wait plug-in, the service template shuts down the virtual server.

- d. If the user selects Cancel or if a response timeout occurs, the service ends abnormally without running the procedure on the virtual server.

When the virtual server is being ended, the service template waits for the time (in seconds) specified in the VMware.checkPowerStateInterval property and verifies that the power is off, which it does up to the number of times specified in the vmware.checkPowerStateCount property. If the default values are not suitable, specify values that suit your environment.

3. Adds a virtual disk to the virtual server.

If there are multiple virtual servers, the service template adds to each virtual server a virtual disk that satisfies the specified conditions. This processing is performed in parallel.

Service Definition Properties

The following table lists the properties visible in the **Service Definition** window for the Add Virtual Disk to Virtual Machine service template.

Property Key	Property Name	Description	Required or optional
vmware.targetHost	Host name of VMware vCenter control server	Specify the host name or IP address of the server (a server with vSphere PowerCLI installed) that will be used to control VMware vCenter. You cannot specify an IPv6 address.	R
vmware.vCenterServerName	VMware vCenter server name	Specify the host name or IP address of the VMware vCenter server. You cannot specify an IPv6 address.	R
vmware.userName	User name for VMware vCenter Server connection	Specify the user name to use when connecting to the VMware vCenter server.	R
vmware.password	Password for VMware vCenter Server connection	Specify the password to use when connecting to the VMware vCenter server.	R

Property Key	Property Name	Description	Required or optional
vmware.portNumber	Port number for VMware vCenter Server connection	Specify the port number to use when connecting to the VMware vCenter server (specifically, the port number of the VMware vCenter server's Web service). If you omit this property, the default value of the VMware vCenter server applies.	O
vmware.protocol	Protocol for VMware vCenter Server connection	Specify the protocol to use when connecting to the VMware vCenter server.	R
UserResponsePlugin.toAddress	TO addresses	Specify the email addresses to enter in the TO field of notification emails sent when the service is waiting for a user response. Separate multiple addresses with commas. Example: mailA,mailB	O
UserResponsePlugin.ccAddress	CC addresses	Specify the email addresses to enter in the CC field of notification emails sent when the service is waiting for a user response. Separate multiple addresses with commas. Example: mailA,mailB	O

Property Key	Property Name	Description	Required or optional
UserResponsePlugin .bccAddress	BCC addresses	Specify the email addresses to enter in the BCC field of notification emails sent when the service is waiting for a user response. Separate multiple addresses with commas. Example: mailA,mailB	O
UserResponsePlugin .mailSubject	Subject line	Specify the subject line of notification emails sent when the service is waiting for a user response.	O
UserResponsePlugin .mailBody	Email text	Specify the body text of notification emails sent when the service is waiting for a user response.	O
UserResponsePlugin .encodeType	Encoding	Specify the encoding of notification emails sent when the service is waiting for a user response. The encodings you can specify are us-ascii, iso-2022-jp, shift_jis, euc-jp, and utf-8. If you omit this property, utf-8 is set.	O
UserResponsePlugin .dialogText	Additional dialog box text	Enter additional text to appear in the response input dialog box, in text or HTML format. Supported HTML tags are anchor tags, bold tags, break tags, font tags, italics tags, and underline tags.	O

Property Key	Property Name	Description	Required or optional
UserResponsePlugin.responseTimeOut	Response timeout time (minutes)	Specify how long (in minutes) the service waits for a user response before timing out. In the event of a response timeout, the service will end abnormally.	R
vmware.checkPowerStateCount	Power status check count	Specifies the number of times to verify the power status when confirming that the virtual server is stopped. In combination with the power status verification interval, this determines the maximum wait time.	R
vmware.checkPowerStateInterval	Power status check interval	Specifies the interval in seconds for verifying the power status when confirming that the virtual server is stopped.	R

Service Definition and Submit Service Properties

The following table lists the properties visible in the **Service Definition** and **Submit Service** windows for the Add Virtual Disk to Virtual Machine service template.

Property Key	Property Name	Description	Required or optional
vmware.foreachVmName	Virtual server name(s)	Specify the virtual server name or names. Specify server names as they appear in VMware vCenter Server, not by host name. Separate multiple virtual servers with commas. The maximum number of virtual servers you can specify is 99.	R
vmware.dataStoreName	Datastore name	If Flat is selected as the virtual disk, specifies the datastore name on which the virtual disk is to be created. If RawVirtual or RawPhysical is selected as the virtual disk, then specifies the datastore name where the LUN mapping is to be saved.	R
vmware.capacity	Volume size (GB)	Specify the volume size in GB. This property is mandatory when "Flat" is specified as the virtual disk type. This property is ignored when the virtual disk type is "RawVirtual" or "RawPhysical".	O

Property Key	Property Name	Description	Required or optional
vmware.vHardDiskType	Virtual disk type	<p>Specify the type of the virtual disk as follows:</p> <ul style="list-style-type: none"> ▪ lat: the virtual disk is created on a VMFS. ▪ RawPhysical: the virtual disk is configured using physical raw device mapping. ▪ RawVirtual: the virtual disk is configured using virtual raw device mapping. 	O
vmware.deviceName	LUN device name	<p>Specify the type of the virtual disk as follows:</p> <ul style="list-style-type: none"> ▪ Flat: the virtual disk is created on a VMFS. ▪ RawPhysical: the virtual disk is configured using physical raw device mapping. ▪ RawVirtual: the virtual disk is configured using virtual raw device mapping. 	O



Note: Although some of the properties in the tables indicate that they can be omitted, they might be required when used in conjunction with some other property setting as indicated in the descriptions.

Prerequisites

The following conditions must be met:

- The virtual servers to be added to the virtual disk are off.
- VMware vSphere ESXi (or VMware ESX Server) is managed by VMware vCenter Server.
- Each virtual server name is unique among the vCenter servers.
- VMwareTools is installed on the target virtual server.

Server requirements

To use this service template, the following servers are needed:

- vCenter server: This is a server on which VMware vCenter Server is installed.
- vCenter control server: This is a server on which VMware vSphere PowerCLI is installed.
- Virtual server: This is a virtual server managed by the vCenter server and VMware vSphere ESX.

Software requirements

One of the following is required:

- VMware vSphere PowerCLI 6.3 Release1, 6.0 Release3, 6.0 Release1
- VMware PowerCLI 6.5 Release1
- VMware PowerCLI 6.5.1, 6.5.4
- VMware PowerCLI 10.1.0, 10.1.1

Usage guidelines

- This service template does not initialize the virtual disks added to the virtual servers. If necessary, log on to the OS on each virtual server and initialize the disk.
- Do not run multiple instances of this service on the same virtual server.
- If you specify HTML tags in UserResponseplugin.dialogText, the permitted tags and attributes are the same as those for the User-Response Wait Plug-in.

Remove Virtual Disk from Virtual Machine: Service details

This service template deletes a virtual disk from a virtual server in a VMware vSphere environment.

The general steps for using this service template to remove a virtual disk from a virtual machine are as follows:

1. Obtains the power status of a virtual server.
2. Verifies that the power status is off.
 - a. If the power status is not off, the service template uses the User-Response Wait Plug-in to determine whether the power is being turned off.

- b. A user with the Modify permission can specify an email destination, email message contents, timeout value, and information to be visible in the window by the User-Response Wait Plug-in.
- c. If the user selects Shutdown in the UI of the User-Response Wait plug-in, the service template shuts down the virtual server.
- d. If the user selects Cancel or if a response timeout occurs, the service ends abnormally without running the process on the virtual server.

When the virtual server is being ended, the service template waits for the time (in seconds) specified in the `VMware.checkPowerStateInterval` property and verifies that the power is off, which it does up to the number of times specified in the `vmware.checkPowerStateCount` property. If the default values are not suitable, specify values that suit your environment.

3. Deletes a virtual disk from a virtual server.

A maximum of 60 characters can be specified in the virtual server name property `vmware.vmName`.

Service Definition Properties

The following table lists the properties visible in the **Service Definition** window for the Remove Virtual Disk from Virtual Machine service template.

Property Key	Property Name	Description	Required or optional
<code>vmware.targetHost</code>	Host name of VMware vCenter control server	Specify the host name or IP address of the server (a server with vSphere PowerCLI installed) that will be used to control VMware vCenter. You cannot specify an IPv6 address.	R
<code>vmware.vCenterServerName</code>	VMware vCenter server name	Specify the host name or IP address of the VMware vCenter server. You cannot specify an IPv6 address.	R
<code>vmware.userName</code>	User name for VMware vCenter Server connection	Specify the user name to use when connecting to the VMware vCenter server.	R

Property Key	Property Name	Description	Required or optional
vmware.password	Password for VMware vCenter Server connection	Specify the password to use when connecting to the VMware vCenter server.	R
vmware.portNumber	Port number for VMware vCenter Server connection	Specify the port number to use when connecting to the VMware vCenter server (specifically, the port number of the VMware vCenter server's Web service). If you omit this property, the default value of the VMware vCenter server applies.	O
vmware.protocol	Protocol for VMware vCenter Server connection	Specify the protocol to use when connecting to the VMware vCenter server.	R
UserResponsePlugin.toAddress	TO addresses	Specify the email addresses to enter in the TO field of notification emails sent when the service is waiting for a user response. Separate multiple addresses with commas. Example: mailA,mailB	O

Property Key	Property Name	Description	Required or optional
UserResponsePlugin .ccAddress	CC addresses	Specify the email addresses to enter in the CC field of notification emails sent when the service is waiting for a user response. Separate multiple addresses with commas. Example: mailA,mailB	O
UserResponsePlugin .bccAddress	BCC addresses	Specify the email addresses to enter in the BCC field of notification emails sent when the service is waiting for a user response. Separate multiple addresses with commas. Example: mailA,mailB	O
UserResponsePlugin .mailSubject	Subject line	Specify the subject line of notification emails sent when the service is waiting for a user response.	O
UserResponsePlugin .mailBody	Email text	Specify the body text of notification emails sent when the service is waiting for a user response.	O
UserResponsePlugin .encodeType	Encoding	Specify the encoding of notification emails sent when the service is waiting for a user response. The encodings you can specify are us-ascii, iso-2022-jp, shift_jis, euc-jp, and utf-8. If you omit this property, utf-8 is set.	O

Property Key	Property Name	Description	Required or optional
UserResponsePlugin.dialogText	Additional dialog box text	Enter additional text to appear in the response input dialog box, in text or HTML format. Supported HTML tags are anchor tags, bold tags, break tags, font tags, italics tags, and underline tags.	O
UserResponsePlugin.responseTimeOut	Response timeout time (minutes)	Specify how long (in minutes) the service waits for a user response before timing out. In the event of a response timeout, the service will end abnormally.	R
vmware.checkPowerStateCount	Power status check count	Specifies the number of times to verify the power status when confirming that the virtual server is stopped. In combination with the power status verification interval, this determines the maximum wait time.	R
vmware.checkPowerStateInterval	Power status check interval	Specifies the interval in seconds for verifying the power status when confirming that the virtual server is stopped.	R

Service Definition and Submit Service Properties

The following table lists the properties visible in the **Service Definition** and **Submit Service** windows for the Remove Virtual Disk from Virtual Machine service template.

Property Key	Property Name	Description	Required or optional
vmware.vmName	Virtual server name	Specify the name of the virtual server. This name is used to represent the virtual server in VMware vCenter server. It is not used as a host name by the OS.	R
vmware.vHardDiskName	Virtual disk name	Specify display name on VMware vCenter for the virtual hard disks.	R



Note: Although some of the properties in the tables indicate that they can be omitted, they might be required when used in conjunction with some other property setting as indicated in the descriptions.

Prerequisites

The following conditions must be met:

- VMware vSphere ESXi (or VMware ESX Server) is managed by VMware vCenter Server.
- Each virtual server name is unique among the vCenter servers.
- VMwareTools is installed on the target virtual server.

Server requirements

To use this service template, the following servers are needed:

- vCenter server: This is a server on which VMware vCenter Server is installed.
- vCenter control server: This is a server on which VMware vSphere PowerCLI is installed.
- Virtual server: This is a virtual server managed by the vCenter server and VMware vSphere ESX.

Software requirements

One of the following is required:

- VMware vSphere PowerCLI 6.3 Release1, 6.0 Release3, 6.0 Release1
- VMware PowerCLI 6.5 Release1
- VMware PowerCLI 6.5.1, 6.5.4
- VMware PowerCLI 10.1.0, 10.1.1

Usage guidelines

- If the virtual disk to delete contains data that you need, make a backup before deleting it.
- The virtual disk is also deleted from the data store.
- Do not run multiple instances of this service on the same virtual server.
- If you specify HTML tags in `UserResponseplugin.dialogText`, the permitted tags and attributes are the same as those for the User-Response Wait plug-in.

Delete Virtual Machine: Service details

This service template deletes a Virtual Machine.

The general steps for using this service template to delete a virtual machine are as follows:

1. The power status of a virtual server is obtained.
2. Verifies that the power status is off.
 - a. If the power status is not off, the service template uses the User-Response Wait Plug-in to determine whether to turn off the power.
 - b. A user with the Modify permission can specify an email destination, email message contents, timeout value, and information to show in the window by the User-Response Wait Plug-in.
 - c. If the user selects Shutdown in the UI of the User-Response Wait plug-in, the service template shuts down the virtual server.
 - d. If the user selects Cancel or if a response timeout occurs, the service ends abnormally without running the process on the virtual server.

When the virtual server is being ended, the service template waits for the time (in seconds) specified in the `VMware.checkPowerStateInterval` property and verifies that the power is off, which it does up to the number of times specified in the `vmware.checkPowerStateCount` property. If the default values are not suitable, specify values that suit your environment. If there are multiple virtual servers, a virtual disk is added to each virtual server that satisfies the specified conditions. This processing is performed in parallel.

3. Deletes the server.

A maximum of 60 characters can be specified in the virtual server name property `vmware.vmName`.

Service Definition Properties

The following table lists the properties visible in the **Service Definition** window for the Delete Virtual Machine service template.

Property Key	Property Name	Description	Required or optional
vmware.targetHost	Host name of VMware vCenter control server	Specify the host name or IP address of the server (a server with vSphere PowerCLI installed) that will be used to control VMware vCenter. You cannot specify an IPv6 address.	R
vmware.vCenterServerName	VMware vCenter server name	Specify the host name or IP address of the VMware vCenter server. You cannot specify an IPv6 address.	R
vmware.userName	User name for VMware vCenter Server connection	Specify the user name to use when connecting to the VMware vCenter server.	R
vmware.password	Password for VMware vCenter Server connection	Specify the password to use when connecting to the VMware vCenter server.	R
vmware.portNumber	Port number for VMware vCenter Server connection	Specify the port number to use when connecting to the VMware vCenter server (specifically, the port number of the VMware vCenter server's Web service). If you omit this property, the default value of the VMware vCenter server applies.	O

Property Key	Property Name	Description	Required or optional
vmware.protocol	Protocol for VMware vCenter Server connection	Specify the protocol to use when connecting to the VMware vCenter server.	R
UserResponsePlugin.toAddress	TO addresses	Specify the email addresses to enter in the TO field of notification emails sent when the service is waiting for a user response. Separate multiple addresses with commas. Example: mailA,mailB	O
UserResponsePlugin.ccAddress	CC addresses	Specify the email addresses to enter in the CC field of notification emails sent when the service is waiting for a user response. Separate multiple addresses with commas. Example: mailA,mailB	O
UserResponsePlugin.bccAddress	BCC addresses	Specify the email addresses to enter in the BCC field of notification emails sent when the service is waiting for a user response. Separate multiple addresses with commas. Example: mailA,mailB	O
UserResponsePlugin.mailSubject	Subject line	Specify the subject line of notification emails sent when the service is waiting for a user response.	O

Property Key	Property Name	Description	Required or optional
UserResponsePlugin .mailBody	Email text	Specify the body text of notification emails sent when the service is waiting for a user response.	O
UserResponsePlugin .encodeType	Encoding	Specify the encoding of notification emails sent when the service is waiting for a user response. The encodings you can specify are us-ascii, iso-2022-jp, shift_jis, euc-jp, and utf-8. If you omit this property, utf-8 is set.	O
UserResponsePlugin .dialogText	Additional dialog box text	Enter additional text to appear in the response input dialog box, in text or HTML format. Supported HTML tags are anchor tags, bold tags, break tags, font tags, italics tags, and underline tags.	O
UserResponsePlugin .responseTimeOut	Response timeout time (minutes)	Specify how long (in minutes) the service waits for a user response before timing out. In the event of a response timeout, the service will end abnormally.	R

Property Key	Property Name	Description	Required or optional
vmware.checkPowerStateCount	Power status check count	Specifies the number of times to verify the power status when confirming that the virtual server is stopped. In combination with the power status verification interval, this determines the maximum wait time.	R
vmware.checkPowerStateInterval	Power status check interval	Specifies the interval in seconds for verifying the power status when confirming that the virtual server is stopped.	R

Service Definition and Submit Service Properties

The following table lists the properties visible in the **Service Definition** and **Submit Service** windows for the Delete Virtual Machine service template.

Property Key	Property Name	Description	Required or optional
vmware.vmName	Virtual server name	Specify the name of the virtual server. This name is used to represent the virtual server in VMware vCenter server. It is not used as a host name by the OS.	R



Note: Although some of the properties in the tables indicate that they can be omitted, they might be required when used in conjunction with some other property setting as indicated in the descriptions.

Prerequisites

The following conditions must be met:

- VMware vSphere ESXi (or VMware ESX Server) is managed by VMware vCenter Server.
- Each virtual server name is unique among the vCenter servers.
- VMwareTools is installed on the target virtual server.

Server requirements

To use this service template, the following servers are needed:

- vCenter server: This is a server on which VMware vCenter Server is installed.
- vCenter control server: This is a server on which VMware vSphere PowerCLI is installed.
- Virtual server: This is a virtual server managed by the vCenter server and VMware vSphere ESX.

Software requirements

One of the following is required:

- VMware vSphere PowerCLI 6.3 Release1, 6.0 Release3, 6.0 Release1
- VMware PowerCLI 6.5 Release1
- VMware PowerCLI 6.5.1, 6.5.4
- VMware PowerCLI 10.1.0, 10.1.1

Usage guidelines

- Do not run multiple instances of this service on the same virtual server.
- If you specify HTML tags in `UserResponseplugin.dialogText`, the permitted tags and attributes are the same as those for the User-Response Wait plug-in.

Deploy and Setup OS on Virtual Machine: Service details

This service template adds a virtual server to a VMware vSphere environment by using a template.

The general steps for using this service template to deploy and set up an OS on a Virtual Machine are as follows:

1. A virtual server is created using an existing template.
2. The initial information for the virtual server is specified.

- a. Specifies initial information for the OS (such as computer name and company name). Depending on the virtual server's OS, the service template specifies the following settings:

For a Windows-based OS, as initial OS settings, the service template specifies a computer name, company name, and organization name. The service template uses sysprep to clear the system information for the virtual server and then specifies the OS information.

For Linux OS, as initial OS settings, the service template specifies a computer name.

- b. Specifies the IP address of the virtual server. You can specify a maximum of two IP address for a virtual server. The order in which IP addresses are set depends on the number of NICs on the virtual server as follows:
 - i. If the virtual server has one NIC, and the management and application IP addresses are both specified, the service template sets the IP address for management in the NIC preferentially. Note that the application IP address is discarded. If only a management IP address or only an application IP address is specified, the service template sets the specified IP address in the NIC.
 - ii. If the virtual server has two NICs, and the management and application IP addresses are both specified, the service template sets the management IP address in the first NIC set in the virtual server's OS and the application IP address in the second NIC set in the virtual server's OS. If only a management IP address or only an application IP address is specified, the service template sets the specified IP address in the first NIC set in the virtual server's OS.
3. If multiple IP addresses are specified for the virtual server, the service template sets a static route for the virtual server's OS.
4. A port group is specified for the virtual server.

When the OS of the virtual server to create is a Windows-based OS:

- An organization name and an owner name are required. If no organization name is specified, "Organization" is assumed; if no owner name is specified, "Owner" is assumed.
- Entry and re-entry of an OS user password are required. If one of them is omitted or if the entered passwords do not match, "Password123" is set as the password.
- WORKGROUP or DOMAIN must be selected from the OS.selectWorkgroupDomain selection list. If neither WORKGROUP nor DOMAIN is selected, "WORKGROUP" is set as the workgroup. If no workgroup name or domain name is entered, "WORKGROUP" is set as the workgroup.
- When WORKGROUP is selected from the OS.selectWorkgroupDomain selection list, a maximum of 15 bytes can be specified for the workgroup name. If the specified workgroup name exceeds 15 bytes, "WORKGROUP" is assumed.
- When DOMAIN is selected from the OS.selectWorkgroupDomain selection list, a domain name, domain user name, and domain password are required. If any one of them is omitted or a specified value is not valid, "WORKGROUP" is set as the workgroup.

When the OS of the virtual server to create is Linux OS:

- When the OS of the virtual server to be created is Linux OS, a domain name and DNS suffix are required. If the specification is omitted, "localdomain" is assumed.

When the OS of the virtual server to create is a Windows-based OS or Linux OS:

- All four of IP address, subnet mask, default gateway, and DNS server must be specified. If any one of them is omitted, none of them is set.
- If the OS information acquisition repeat count is omitted, "72" is assumed.
- If the OS information acquisition repeat interval is omitted, "5" is assumed.
- You must specify both the current port group name and the new port group name. If either is omitted, the port group is not renamed. If there are multiple port groups with the same name, only one of them is renamed.
- All three of destination IP address, subnet mask, and default gateway must be specified. If any one of them is omitted, a static route is not set.
- A maximum of 60 characters can be specified in the virtual server name property (vmware.vmName).

Service Definition Properties

The following table lists the properties visible in the **Service Definition** window for the Deploy and Setup OS on Virtual Machine service template.

Property Key	Property Name	Description	Required or optional
vmware.targetHost	Host name of VMware vCenter control server	Specify the host name or IP address of the server (a server with vSphere PowerCLI installed) that will be used to control VMware vCenter. You cannot specify an IPv6 address.	R
vmware.vCenterServerName	VMware vCenter server name	Specify the host name or IP address of the VMware vCenter server. You cannot specify an IPv6 address.	R
vmware.userName	User name for VMware vCenter Server connection	Specify the user name to use when connecting to the VMware vCenter server.	R

Property Key	Property Name	Description	Required or optional
vmware.password	Password for VMware vCenter Server connection	Specify the password to use when connecting to the VMware vCenter server.	R
vmware.portNumber	Port number for VMware vCenter Server connection	Specify the port number to use when connecting to the VMware vCenter server (specifically, the port number of the VMware vCenter server's Web service). If you omit this property, the default value of the VMware vCenter server applies.	O
vmware.protocol	Protocol for VMware vCenter Server connection	Specify the protocol to use when connecting to the VMware vCenter server.	R
windows.orgName	Organization (company name): Windows only	Specify the organization name for the virtual server OS (Windows-based OS only). When there is no input, "Organization" is set up.	O
windows.ownerName	Owner name: Windows only	Specify the owner name for the OS on the virtual server (Windows-based OS only). When there is no input, "Owner" is set as the Owner name.	O

Property Key	Property Name	Description	Required or optional
OS.selectWorkgroupDomain	Select workgroup or domain : Windows only	Specify whether the virtual server belongs to a workgroup or domain (Windows-based OS only).	O
OS.workgroupNameDomainName	Workgroup/domain name	Specify the name of the workgroup or domain of virtual server. A workgroup is specified a maximum of 15 characters. A domain of a maximum of 63 characters is specified in a Windows-based OS. In Linux OS, a domain of a maximum of 256 characters is specified.	O
OS.domainUserName	Domain user name: Windows only	Specify the domain user name for the virtual server (Windows-based OS only). When "DOMAIN" is chosen by selection of a workgroup/domain, it is necessary to input.	O
OS.domainUserPassword	Domain password: Windows only	Specify the domain password for the virtual server (Windows-based OS only). When "DOMAIN" is chosen by selection of a workgroup/domain, it is necessary to input.	O

Property Key	Property Name	Description	Required or optional
OS.dnsSuffix	DNS suffix: Linux only	Specify the DNS suffix of the virtual server (Linux OS only). When there is no input, "localdomain" is set as the DNS suffix.	O
OS.subnetMaskMan	Subnet mask (management LAN)	Specify the subnet mask for the management LAN of the virtual server. You cannot specify an IPv6 address.	O
OS.defaultGWMan	Default gateway (management LAN)	Specify the default gateway for the management LAN of the virtual server. You cannot specify an IPv6 address.	O
OS.dnsMan	DNS server IP address (management LAN)	Specify the IP address of the DNS server for the management LAN of the virtual server. You cannot specify an IPv6 address.	O
OS.subnetMask2	Subnet mask (for second NIC)	Specify the 2nd subnet mask for the virtual server. You cannot specify an IPv6 address.	O
OS.defaultGW2	Default gateway (for second NIC)	Specify the 2nd default gateway for the virtual server. You cannot specify an IPv6 address.	O
OS.dns2	DNS server IP address (for second NIC)	Specify the 2nd IP address of the DNS server for the virtual server. You cannot specify an IPv6 address.	O

Property Key	Property Name	Description	Required or optional
OS.subnetMask3	Subnet mask (for third NIC)	Specifies the subnet mask that is set for the third NIC recognized by the OS on the virtual server. IPv6 addresses are not supported.	O
OS.defaultGW3	Default gateway (for third NIC)	Specifies the default gateway that is set for the third NIC recognized by the OS on the virtual server. IPv6 addresses are not supported.	O
OS.dns3	DNS server IP address (for third NIC)	Specifies the IP address of the DNS server that is set for the virtual server. In a Windows-based OS, this value is set on the third NIC recognized by the OS. IPv6 addresses are not supported.	O
OS.subnetMask4	Subnet mask (for fourth NIC)	Specifies the subnet mask that is set for the fourth NIC recognized by the OS on the virtual server. IPv6 addresses are not supported.	O
OS.defaultGW4	Default gateway (for fourth NIC)	Specifies the default gateway that is set for the fourth NIC recognized by the OS on the virtual server. IPv6 addresses are not supported.	O

Property Key	Property Name	Description	Required or optional
OS.dns4	DNS server IP address (for fourth NIC)	Specifies the IP address of the DNS server that is set for the virtual server. In a Windows-based OS, this value is set on the fourth NIC recognized by the OS. IPv6 addresses are not supported.	O
OS.destIPAddress	Destination IP of static route	Specify the destination IP address of the static route.	O
OS.subnetMaskStaticRoute	Subnet mask (static route)	Specify the subnet mask for the static route. You cannot specify an IPv6 address.	O
OS.defaultGWStaticRoute	Default gateway (static route)	Specify the default gateway for the static route. You cannot specify an IPv6 address.	O
vmware.checkOSInitCount	Number of tries to acquire OS information	Specify the number of times the service tries to acquire OS information to confirm that the OS has been initialized. The maximum wait time is determined by this property and the property that defines the checkOSInitCountInterval.	O

Property Key	Property Name	Description	Required or optional
vmware.checkOSInitCountInterval	Interval for acquiring OS information (minutes)	Specify the interval at which the service tries to acquire OS information to confirm that the OS has been initialized.	O

Service Definition and Submit Service Properties

The following table lists the properties visible in the **Service Definition** and **Submit Service** windows for the Deploy and Setup OS on Virtual Machine service template:

Property Key	Property Name	Description	Required or optional
vmware.vmName	Virtual server name	Specify the name of the virtual server. This name is used to represent the virtual server in VMware vCenter server. It is not used as a host name by the OS.	R
vmware.templateName	Template name	Specify the name of the template on which the virtual server is to be based.	R
vmware.vmHostName	ESX server name	Specify the ESX server name to be visible in the Hosts and Clusters inventory view managed by VMware vCenter server.	R
vmware.dataStoreName	Datastore name	Specify the datastore name.	R
vmware.resourcePoolName	Resource pool name	Specify the resource pool, vApp, or cluster where the virtual server will be provisioned.	O

Property Key	Property Name	Description	Required or optional
vmware.portGroupName	Port group name	Specify the name of the port group currently assigned to the virtual server.	O
vmware.portGroupNameNew	Port group name (updated)	Specify a new port group name to assign to the virtual server.	O
OS.computerName	Computer/host name	Specify the computer name (host name) used by the OS. The computer name of a maximum of 15 characters is specified, in the case of a Windows-based OS. The computer name of a maximum of 63 characters is specified, in the case of Linux OS.	R
OS.osUserPassword	Administrator password: Windows-specific	Specifies the Administrator password specified in the OS (Windows-based OS systems only). If nothing is entered, "Password123" is specified.	O
OS.osUserPasswordReEnter	Re-enter Administrator password: Windows-specific	Re-enter the Administrator password specified in the OS (Windows-based OS systems only). If nothing is entered, "Password123" is specified.	O

Property Key	Property Name	Description	Required or optional
OS.productKey	OS product key :Windows-based OS only	Specify the OS product key (for Windows-based OS virtual servers) in the format XXXXX-XXXXX-XXXXX-XXXXX (Windows-based OS only).	O
Linux.adminPassword	OS root user password :Linux OS only	Specify the root user's password of OS for carrying out a OS setting verification. For creating Linux OS virtual server, specifying the root user's password is mandatory.	O
OS.ipAddressMan	IP address (management LAN)	Specify the IP address for the management LAN of the virtual server. You cannot specify an IPv6 address.	O
OS.ipAddress2	IP address (for second NIC)	Specify the 2nd IP address for the virtual server. You cannot specify an IPv6 address.	O
OS.ipAddress3	IP address (for third NIC)	Specifies the IP address that is set for the third NIC recognized by the OS on the virtual server. IPv6 addresses are not supported.	O

Property Key	Property Name	Description	Required or optional
OS.ipAddress4	IP address (for fourth NIC)	Specifies the IP address that is set for the fourth NIC recognized by the OS on the virtual server. IPv6 addresses are not supported.	O
OS.timeZoneWin	Time zone: Windows-based OS setting	Specifies the time zone that the OS on the virtual server is set to (for Windows-based OS only). If nothing is entered, the time zone "International Date Line West" is used.	O
OS.timeZoneLin	Time zone: Linux OS setting	Specifies the time zone that the OS on the virtual server is set to (for Linux OS only). If nothing is entered, the time zone in the template is used.	O



Note: Although some of the properties in the tables indicate that they can be omitted, they might be required when used in conjunction with some other property setting as indicated in the descriptions.

Prerequisites

The following conditions must be met:

- Conditions for the settings on VMware vSphere ESXi (or VMware ESX Server)
 - A data store is registered.
 - A port group is set up. For a port group that is set up for the virtual server, specify a port group on the network using a standard virtual switch (vNetwork or vSphere standard switch.)
 - The template used for deployment is already created.
 - If the virtual server is stored in a resource pool, and the resource pool, cluster, and vApp names are unique. The same name cannot be assigned to more than one resource pool, cluster, and vApp although their types are different, such as a duplication of a cluster name and a vApp name or a duplication of a cluster name and a resource pool name.
 - Data store name.
 - Resource pool name.
 - vApp name.
- Conditions for the template used for deployment: 34530093christine van every
 - VMware Tools are installed.
 - The running of remote commands is allowed by the settings (administrative share for Windows-based OS and SSH for Linux OS is enabled.)
 - NICs are configured (up to two).
 - The reception of and response to pings is allowed.
 - For a Windows-based OS, the administrator password is left blank.
 - For a Windows-based OS, run sysprep. To run sysprep, the maximum number of Windows-based OS initializations (three times) must not be reached.
 - When you convert a virtual server to a template, first ensure that the virtual server is stopped.
- Condition of the virtual server:
 - The virtual server name is not duplicated under the management of an identical vCenter.
- The authentication information of the virtual server to deploy is registered to the agentless connection destination definition in the "Management" tab in advance.

Server requirements

To use this service template, the following servers are needed:

- vCenter server: This is a server on which VMware vCenter Server is installed.
- vCenter control server: This is a server on which VMware vSphere PowerCLI is installed.

- ESX server: Server on which VMware vSphere ESXi (or VMware ESX Server) is installed.
- Virtual server: This is a virtual server managed by the vCenter server and VMware vSphere ESX.

Software requirements

One of the following is required:

- VMware vSphere PowerCLI 6.3 Release1, 6.0 Release3, 6.0 Release1
- VMware PowerCLI 6.5 Release1
- VMware PowerCLI 6.5.1, 6.5.4
- VMware PowerCLI 10.1.0, 10.1.1

Usage guidelines

- The specified port group must be able to communicate with the local server. If there are multiple NICs for the virtual server, set one of the NICs to a port group that can communicate with the local server.
- Whether OS initialization processing is completed is determined by whether the information set in the OS can be acquired. The time required for determining completion of initialization depends on the value specified for the OS information acquisition repeat interval (vmware.checkOSInitCountInterval property) and the specification of the OS information acquisition repeat count (vmware.checkOSInitCount property). If the specified value is too small, a timeout might occur even during OS initialization. Adjust the value for the performance of the virtualization environment being used. Initially, specify the settings so that the OS information acquisition repeat interval is at least a few hours.
- Do not specify for the IP addresses to set with values that are not valid as IP addresses in the virtual server's OS, such as management and application IP addresses. For example, network addresses, broadcast addresses, and special addresses such as 0.0.0.0 and 255.255.255.255 cannot be specified. If an address is entered that is not valid, the virtual server deployment processing results in an error. For a management IP address, specify an IP address that can be used to communicate with the local server. Be aware that even though the correct address is specified, deployment might fail.
- While the virtual server is being deployed, do not use any other service to modify it. Doing so might cause deployment of the virtual server to fail. Also, do not modify the virtual server directly from a vCenter server.
- When you are deploying Linux OS, specify a root password for the template OS in the Linux.adminPassword property (using the permitted characters.)
- Do not specify in advance any template information that is specified when the virtual server is created. If a computer name or host name and IP address are already set in the template, virtual server creation might fail. If virtual server creation fails (for example, static route processing results in an error), delete the virtual server, re-create a template in which no computer name, host name, or IP address is set, and then run the service again.
- The IP addresses are set as described in Function. However, depending on the order in which NICs are set in the virtual server's OS, the IP addresses might not be set as intended. After you create the virtual server, verify whether the correct IP addresses are set. If the correct IP addresses are not set, change them manually.

Get List of Virtual Machines from VMware vSphere: Service details

This service template obtains a list of virtual server information.

If no ESX server name is specified, the service template obtains information about all virtual servers on all ESX servers in the specified vCenter server. By specifying a specific ESX server name, only information for that specific server is obtained.

The general steps for using this service template to obtain a listing of virtual server information are as follows:

1. A list of virtual server information is output in CSV format to a temporary file in the remote system.
2. The temporary file is forwarded from the remote system to a specified output file on the local system.
3. The temporary file is deleted from the remote system. The service template outputs the following items to a CSV file (the items are separated by the comma):
 - a. ESX server name (header name: HostName)
 - b. Virtual server name (header name: VMName)
 - c. Virtual server power status (header name: PowerState)
 - d. Number of CPUs in the virtual server#1 (header name: NumCpu)
 - e. Virtual server memory capacity (MB) (header name: MemoryMB)

#1: The number of CPUs depends on the VMware vCenter Server version:

If the VMware vCenter Server version is 4.1 or earlier, this is the number of virtual processors.

If the VMware vCenter Server version is 5.0 or later, this is the total number of cores (number of virtual sockets × number of cores per socket).

Service Definition Properties

The following table lists the properties visible in the **Service Definition** window for the Get List of Virtual Machines from VMware vSphere service template.

Property Key	Property Name	Description	Required or optional
vmware.targetHost	Host name of VMware vCenter control server	Specify the host name or IP address of the server (a server with vSphere PowerCLI installed) that will be used to control VMware vCenter. You cannot specify an IPv6 address.	R

Property Key	Property Name	Description	Required or optional
vmware.vCenterServerName	VMware vCenter server name	Specify the host name or IP address of the VMware vCenter server. You cannot specify an IPv6 address.	R
vmware.userName	User name for VMware vCenter Server connection	Specify the user name to use when connecting to the VMware vCenter server.	R
vmware.password	Password for VMware vCenter Server connection	Specify the password to use when connecting to the VMware vCenter server.	R
vmware.portNumber	Port number for VMware vCenter Server connection	Specify the port number to use when connecting to the VMware vCenter server (specifically, the port number of the VMware vCenter server's Web service). If you omit this property, the default value of the VMware vCenter server applies.	O
vmware.protocol	Protocol for VMware vCenter Server connection	Specify the protocol to use when connecting to the VMware vCenter server.	R

Service Definition and Submit Service Properties

The following table lists the properties visible in the **Service Definition** and **Submit Service** windows for the Get List of Virtual Machines from VMware vSphere service template.

Property Key	Property Name	Description	Required or optional
vmware.vmHostName	ESX server name	Specify the ESX server name to show in the Hosts and Clusters inventory view managed by VMware vCenter server.	O
vmware.listOutputFileNameRemote	Output file name (remote)	Specifies the full path name of the temporary file to output virtual server information to the VMware vCenter control server.	R
vmware.listOutputFileNameLocal	Output file name (local)	Specifies the full path name of the file on the local server for acquiring the virtual server information.	R



Note: Although some of the properties in the tables indicate that they can be omitted, they might be required when used in conjunction with some other property setting as indicated in the descriptions.

Prerequisites

The following conditions must be met:

- VMware vSphere ESXi (or VMware ESX Server) is managed by VMware vCenter Server.
- Each virtual server name is unique among the vCenter servers.
- VMwareTools is installed on the target virtual server.

Server requirements

To use this service template, the following servers are needed:

- vCenter server: This is a server on which VMware vCenter Server is installed.
- vCenter control server: This is a server on which VMware vSphere PowerCLI is installed.
- Virtual server: This is a virtual server managed by the vCenter server and VMware vSphere ESX.

Software requirements

One of the following is required:

- VMware vSphere PowerCLI 6.3 Release1, 6.0 Release3, 6.0 Release1
- VMware PowerCLI 6.5 Release1
- VMware PowerCLI 6.5.1, 6.5.4
- VMware PowerCLI 10.1.0, 10.1.1

Usage guidelines

- If the file name specified for the remote or the local system already exists, that file is overwritten. In addition, the file in the remote system is deleted. For this reason, you must make sure that the specified file names are correct.
- If there is no folder on the specified path in the remote system, a folder is created. Any folder that is created remains and is not deleted; for this reason, you must delete unneeded folders periodically.

Script execution through the vCenter server: Service details

This service template functions in the VMware vSphere environment to transmit the specified non-interactive script file from the target server to the guest OS on the virtual server through the vCenter server, and then runs the script file on the guest OS. The script file can be deleted if it is no longer needed.

The following is an overview of the processing:

1. Run the PowerCLI commandlet **Copy-VMGuestFile** on the target server to transmit the specified script from the target server to the guest OS on the virtual server.

2. Run the PowerCLI commandlet **Invoke-VMScript** on the target server to run the script transmitted in (1). Then, run the scripts on the virtual server by using the following codes.

Windows batch file (extension **.bat**):

```
"& 'script-file-path-on-the-guest-OS- (vmware.scriptFileOnGuest-
property)' 'script-argument- (vmware.scriptParameter-property)' ;
exit $LASTEXITCODE"
```

Windows PowerShell script (extension **.ps1**):

```
"Set-ExecutionPolicy RemoteSigned -Scope Process ; & 'script-
file-path-on-the-guest-OS- (vmware.scriptFileOnGuest-property)'
'script-argument- (vmware.scriptParameter-property)' ; exit
$LASTEXITCODE"
```

Shell script (extension **.sh**):

```
"/bin/bash 'script-file-path-on-the-guest-OS-
(vmware.scriptFileOnGuest-property)' 'script-argument-
(vmware.scriptParameter-property)' "
```

The standard output and standard error output of each script run on the virtual server is stored in the file on the target server that is specified as the output file path (vmware.scriptOutputFilePath property) of the script.

3. If yes is specified for whether to delete the script (vmware.deleteScriptEnabled property), the script transmitted from the target server to the guest OS on the virtual server can be deleted. To delete the script, use the following code applicable to the virtual server environment.

Windows-based OS:

```
"Remove-Item -LiteralPath 'script-file-path-on-the-guest-OS-
(vmware.scriptFileOnGuest-property)' -Force "
```

Linux OS:

```
"/bin/rm -f 'script-file-path-on-the-guest-OS-
(vmware.scriptFileOnGuest-property)' "
```

Server requirements

The following servers are needed:

- vCenter server
Server where VMware vCenter Server is installed.
- ESX server
Server where VMware vSphere ESXi is installed.

- vCenter control server (execution target server)
Server where VMware vSphere PowerCLI is installed. Plug-ins are transferred to this server and run by this product.
- Virtual server
Virtual server that is managed by the vCenter server and VMware vSphere ESX.

Prerequisites

- VMware vSphere ESXi must be managed by VMware vCenter Server.
- Conditions related to the settings on VMware vCenter Server:
 - Virtual servers must have a unique name.
 - Server names are case-sensitive in VMware, but not in the vSphere PowerCLI instance run from this plug-in.
- Conditions related to the virtual server:
 - The virtual server must be running.
 - If the virtual server OS is a Windows-based OS, Windows PowerShell 2.0 or later must be installed.
 - VMwareTools must be installed on the virtual server.

Software requirements

One of the following is required:

- VMware vSphere PowerCLI 6.3 Release1, 6.0 Release3, 6.0 Release1
- VMware PowerCLI 6.5 Release1
- VMware PowerCLI 6.5.1, 6.5.4
- VMware PowerCLI 10.1.0, 10.1.1

Usage guidelines

- If a file with the same name exists in the location specified by the path to the script file on the guest OS (`vmware.scriptFileOnGuest` property) or the path to the output file for the script (`vmware.scriptOutputFilePath` property), the existing file is overwritten. If any of the folders specified by the file path do not exist, that folder is created and the file is transmitted. Delete the created folder if it is no longer necessary.
- If a folder with the same name exists in the location specified by the path to the script file on the guest OS (`vmware.scriptFileOnGuest` property), the target script file is transmitted and stored in the existing folder without any change to the file name. If this occurs, the script fails and the service ends abnormally.
- If an error occurs during file transmission, the file that is being transmitted to the virtual server is not deleted automatically. Delete this file if it is not necessary.
- Do not run interactive scripts that need user entry, or scripts that display a UI and do not end automatically.

- Do not run this service template on the same virtual server simultaneously.
- The script specified as the script file on the VMware vCenter control server (`vmware.scriptFileOnHost` property) is transferred to the guest OS in binary format. Create the script in advance on the guest OS by using executable line break codes and character codes.

Service Definition Properties

The following table lists the properties shown in the **Service Definition** window.



Note: Consider the following precautions when setting properties:

- You can specify the following script files for the script file path on the guest OS (`vmware.scriptFileOnGuest` property): Windows batch file (extension `.bat`), Windows PowerShell script (extension `.ps1`), and shell script (extension `.sh`).
- When you specify multiple arguments for the script argument (`vmware.scriptParameter` property), you can separate arguments by using a single-byte comma (,) or single-byte hyphen (-).

Property key	Property name	Description	Required or optional
<code>vmware.targetHost</code>	Host name of VMware vCenter control server	Specify the host name or IP address of the server (a server with vSphere PowerCLI installed) that will be used to control VMware vCenter. You cannot specify an IPv6 address.	R
<code>vmware.vCenterServerName</code>	VMware vCenter server name	Specify the host name or IP address of the VMware vCenter server. You cannot specify an IPv6 address.	R
<code>vmware.userName</code>	User name for VMware vCenter Server connection	Specify the user name to use when connecting to the VMware vCenter server.	R

Property key	Property name	Description	Required or optional
vmware.password	Password for VMware vCenter Server connection	Specify the password to use when connecting to the VMware vCenter server.	R
vmware.portNumber	Port number for VMware vCenter Server connection	Specify the port number to use when connecting to the VMware vCenter server (specifically, the port number of the VMware vCenter server's Web service). If you omit this property, the default value of the VMware vCenter server applies.	O
vmware.protocol	Protocol for VMware vCenter Server connection	Specify the protocol to use when connecting to the VMware vCenter server.	R

Service Definition and Submit Service Properties

The following table lists the properties shown in the **Service Definition** window and the **Submit Service** window.

Property key	Property name	Description	Required or optional
vmware.vmName	Virtual server name	Specify the name of the virtual server. This name is used to represent the virtual server in VMware vCenter server. It is not used as a host name by the OS.	R

Property key	Property name	Description	Required or optional
vmware.guestOSUserName	User name for logging in to the guest OS	Specify the user name for logging in to the guest OS.	R
vmware.guestOSUse rPassword	Password for logging in to the guest OS	Specify the password for logging in to the guest OS.	R
vmware.scriptFileOn Host	Script file on the VMware vCenter control server	Specify the full path of the script file on the VMware vCenter control server that is the transmission source.	R
vmware.scriptFileOn Guest	Script file on the guest OS	Specify the full path of the script file on the guest OS that is the transmission destination. The script file specified for this property is run after transmission.	R
vmware.scriptParameter	Script argument	Specify a script argument. To specify multiple arguments, separate the arguments by using the specified delimiter for script arguments (a single-byte comma or single-byte hyphen).	O
vmware.scriptParameter Delimiter	Delimiter for script arguments	Specify a delimiter for script arguments. You can specify a single-byte comma (,) or a single-byte hyphen (-). If this property is omitted, values specified for the script argument are handled as a single argument.	O

Property key	Property name	Description	Required or optional
vmware.scriptOutput FilePath	Script output file path	Specify the full path of the file on the VMware vCenter control server in which the standard output and standard error output of the script are stored.	R
vmware.deleteScript Enabled	Whether to delete the script	Specify whether to delete the script after execution. If yes is selected, the script is deleted. If no is selected, the script is not deleted.	R

OS service templates

The following additional OS service templates are not imported by default. However, you can import them by accessing the server through a remote connection and then using the Ops Center Automator UI. See [Importing service templates \(on page 495\)](#) for more information.

Get List of Users from Server

Obtains a list of Windows-based OS or Linux OS users from a specific host.

Get Lists of Users from Multiple Servers

Obtains a list of Windows-based OS or Linux OS users from multiple hosts.

Execute Remote Command

Runs a command on the remote execution target server.

Get List of Users from Server: Service details

This service template obtains a list of Windows-based OS or Linux OS users.

The general steps for using this service template to get a list of users from a server are as follows:

1. An OS user list is obtained and output in text format to a specified file. For Windows-based OS, the output format of the file is the same as the output result of the net user command.
2. The file is transferred to the folder specified by the local server.
3. The transferred source file on the Windows-based OS or Linux OS server is deleted.

Service Definition and Submit Service Properties

The following table lists the properties shown in the **Service Definition** and **Submit Service Request** windows for the Get List of Users from Server service template.

Property Key	Property Name	Description	Required
OS.targetHost	Windows/Linux server host name	Specify the host name or IP address of a Windows-based OS or Linux OS server from which an OS user list is to be obtained. IPv6 addresses are not supported.	R
OS.userType	OS user type	Specify "local" or "domain" as the OS user type. This property only takes effect when the agent server is running Windows-based OS.	O
OS.listOutputFileNameRemote	Output file name (remote)	Specifies the full path name of the file on the Windows-based OS server or Linux OS server where the list of OS users is output. The remote file is deleted after the transfer.	R
OS.listOutputFileNameLocal	Output file name (local)	Specifies the local file name where the list of OS users is output.	R



Note: Although some of the properties in the tables indicate that they can be omitted, they might be required when used in conjunction with some other property setting as indicated in the descriptions.

Server requirements

- Supported Windows-based OS or Linux OS servers

Usage guidelines

- If you are running this service in a Linux OS environment, do not use multibyte characters in properties.
- If you specify multibyte characters, and the OS of the server obtaining the list of OS users is a Windows-based OS, specify a value for the output file name (remote) property that is no longer than 256 bytes.
- If you specify multibyte characters, specify a value for the output file name (local) property that is no longer than 256 bytes.
- If the file names specified for remote and local already exist, the existing files are overwritten. The file on the remote side is also deleted. For this reason, make sure that file names are specified correctly.
- If there is no folder at the path specified as remote, the folder is created. The created folder is left undeleted. If it is not used periodically, delete it.

Get Lists of Users from Multiple Servers: Service details

This service template acquires a list of Windows-based OS or Linux OS users and servers listed in a CSV file.

The general steps for using this service template to get a list of users from multiple servers are as follows:

1. A list of Windows-based OS or Linux OS servers is obtained from the specified column in the CSV file. State the column name in the first line of the CSV file. State the data in the 2nd through 100th lines. At least one column must state the host name or IP address. Here is an example:

```
Host name
hostVM001
hostVM002
```

2. No more than 99 host names or IP addresses can be stated in a CSV file and the total character string length of host names or IP addresses + the host count cannot exceed 1,017 characters.
3. The fields read are verified for the following conditions. If any of these conditions are met, the task fails.
 - a. A field exceeds 1024 in character string length.
 - b. A field contains the following special characters , < > | ; & * ? ` % or a double quote (") not at an end of a field, or a backslash (\) at the end of a field.
 - c. A field contains a control character (0x00 through 0x1f.)

4. An OS user list is output in text format to the specified file for each Windows-based OS or Linux OS server. The name of the file is `OS_Users_XXXX`, where `XXXX` specifies the host name or IP address as stated in the string specified in the CSV file. For Windows-based OS, the output format of the file is the same as the output result of the `net user` command.
5. The OS user list file is transferred to the folder specified by the local server. The transfer source file on the Windows-based OS or Linux OS server is deleted.



Note: If reading a CSV fails, wait for the seconds specified in the `OS.fileOpenRetryInterval` property, and then repeat the number of times specified in the `OS.fileOpenRetryCount` property to try again for reading a file. If necessary, modify the property values for your system environment.

Service Definition Properties

The following table lists the properties shown in the **Service Definition** window for the Get Lists of Users from Multiple Servers service template.

Property Key	Property Name	Description	Required or optional
OS.fileOpenRetryCount	Retry count for reading a file: Windows specific	Specifies the number of times to try again when reading a file fails (only applicable to Windows-based OS). This value multiplied by the interval between tries gives the maximum waiting time. If "0" is specified, another try is not performed.	R
OS.fileOpenRetryInterval	Retry interval for reading a file: Windows specific	Specifies the interval in seconds between tries when reading a file fails (only applicable to Windows-based OS).	R

Service Definition and Submit Service Properties

The following table lists the properties shown in the **Service Definition** and **Submit Service** windows for the Get Lists of Users from Multiple Servers service template.

Property Key	Property Name	Description	Required or optional
OS.excelFileName	CSV file name (local)	Specifies the full path name of the CSV file where the list of servers is managed.	R
OS.Column1	Column number for the server names	Specifies the column number in the CSV file as a number from 1 through 255.	R
OS.userType	OS user type	Specify "local" or "domain" as the OS user type. This property only takes effect when the server acquiring the list of OS users is running Windows-based OS.	O
OS.listOutputFolderNameRemote_Windows	Output folder for Windows OS (remote)	Specifies the full path of the folder on the Windows-based OS server where the list of OS users is output. The remote file is deleted after the transfer. The output folder must be specified if the servers where the user list is acquired include a Windows-based OS server.	O

Property Key	Property Name	Description	Required or optional
OS.listOutputDirectoryNameRemote_Linux	Output directory for Linux (remote)	Specifies the full path of the folder on the Linux OS server where the list of OS users is output. The remote file is deleted after the transfer. The output folder must be specified if the servers where the user list is acquired include a Linux OS server.	O
OS.listOutputFolderNameLocal	Output folder name (local)	Specifies the full path name of the file where the list of OS users is output.	R



Note: Although some of the properties in the tables indicate that they can be omitted, they might be required when used in conjunction with some other property setting as indicated in the descriptions.

Server requirements

To use this service template, the following servers are needed:

- Windows-based OS or Linux OS servers.

Usage guidelines

- To run this service, the local server (loopback address resolved by localhost) and the server acquiring the list of OS users must be set as agentless connection destinations.
- IP addresses in the CSV file must be enclosed in double quotation marks.
- If the OS of the server acquiring the list of OS users is Linux OS, do not use multibyte characters in properties.
- Because of ODBC driver restrictions, the following characters within parenthesis cannot be used in CSV file names: ([] ! `) .
- If you specify multibyte characters and the OS of the server acquiring the list of OS users is Windows-based OS, specify a value for the Windows-based OS output folder (remote) property that is no longer than 248 bytes.
- If you specify multibyte characters, specify a value for the output folder name (local) property that is no longer than 256 bytes.

- When the folder names specified as remote and local already exist, the existing folders are overwritten. Also, when there is a file by the same name in the folder, it is also overwritten. For this reason, verify that folder names are specified correctly.
- If there is no folder at the path specified as remote, the folder is created. The created folder is left undeleted. If it is not used periodically, delete it.

Execute Remote Command: Service details

This service template runs commands stored on a server and outputs the results.

Service Definition Properties

The following table lists the properties shown in the **Service Definition** and **Submit Service** windows for the Execute Remote Command service template.

Property Key	Property Name	Description	Required or optional
common.targetHost	Host name of target server	Specifies the host name or IP address of the target server. IPv6 addresses are not supported.	R
common.remoteCommand	Command	Specify the full path of the command to run on the target server. If the path contains a space, enclose the entire path in double quotation marks.	R
common.remoteCommandParameter	Command parameters	Specify the parameters for the command to run on the target server. If a parameter contains a space, enclose the entire parameter in double quotation marks.	O



Note: Although some of the properties in the tables indicate that they can be omitted, they might be required when used in conjunction with some other property setting as indicated in the descriptions.

Usage guidelines

- If the standard output result of the command exceeds 100 KB, the service ends abnormally.
- Up to 1,024 characters of the standard output result of the command are stored in property `common.stdoutProperty`; any output more than this is discarded.
- Interactive commands and scripts that need user input and commands that do not end automatically using a UI display or similar input cannot be run.
- If the OS running on the target server is Linux, the command is run in the default locale defined in the agentless-connection target for the connected user.

Server requirements

To use this service template, the following servers are needed:

- Target server: This is the server on which a supported version of Windows-based OS or Linux OS is installed. The commands must already be stored on the server.

Hyper-V 2016 service templates

The following is a list of the additional Ops Center Automator Hyper-V 2016 service templates, which are not imported by default. However, you can import them by accessing the server through a remote connection and then using the Ops Center Automator UI. See [Importing service templates \(on page 495\)](#) for more information.

Add a virtual server (deploy/OS initial settings)

Adds a new virtual server in a Hyper-V environment using an exported virtual server.

Add virtual server (virtual disk)

Creates a virtual disk in a Hyper-V environment and then adds that virtual disk to a virtual server.

Change virtual server specifications (CPU and memory)

Changes the specified resource settings (CPU and memory) of a virtual server in a Hyper-V environment.

Delete virtual server

Deletes virtual servers in a Hyper-V environment.

Obtain virtual server information list

Obtains a list of information about virtual servers in a Hyper-V environment.

Restart virtual server

restarts multiple virtual servers in a Hyper-V environment.

Start virtual server

Starts multiple virtual servers in a Hyper-V environment.

Stop virtual server

Shuts down the operating systems of multiple virtual servers in a Hyper-V environment.

Add a virtual server (deploy/OS initial settings): Service details

This service template uses an exported virtual server to add a new virtual server in a Hyper-V environment.

The general steps for using this service template are as follows:

1. A virtual server is created on the Hyper-V server.
 - a. Replicate a virtual server from an already exported one in the import destination folder.
 - b. Create a virtual server by using the import function on the Hyper-V server.

Assign a new unique ID to the new virtual server you create. If the specified import destination folder already exists, the folder is used as is.
2. The virtual server's connection destination (management-use) virtual switch is set up.

You must set up a management-use virtual switch for a NIC to establish communication with the local server.

If a connection-destination virtual switch has already been set on the exported virtual server, the switch is replaced by the specified one.

For the first NIC, set up a management-use virtual switch that can communicate with the local server. For the second to fourth NICs, set a management-use or operation-use virtual switch according to the user operating needs.

If the number of specified virtual switches exceeds the number of NICs on the virtual server, only the virtual switches allocated to NICs are enabled.
3. A response file to be used for OS customization is created and deployed.
 - a. Mount the virtual disk of the virtual server to the Hyper-V server.
 - b. On the mounted virtual disk, create a response file to be used for OS customization.
 - c. Unmount the virtual disk from the Hyper-V server.
4. The virtual server starts, and the initial settings on the virtual server are specified.
 - a. Specify the initial OS settings (such as the computer name and company name).
 - b. Set the computer name, company name, organization name, and time zone as the initial OS settings.

c. Set IP addresses for the virtual server.

A virtual server can have a maximum of four IP addresses. For the first IP address (management-use IP address), set an IP address for managing the deployed virtual server. For the second to fourth IP addresses, set an IP management-use IP address or operation-use IP address according to the user operating needs. Some settings must connect to the OS by using a management-use IP address. The order in which IP addresses are set differs depending on the number of NICs installed on the virtual server, as follows.

When only one NIC is installed on the virtual server.

The IP address to be set for the NIC is determined based on the following priority: IP address for management > second IP address > third IP address > fourth IP address. Among the specified IP addresses, only the one with the highest priority is set and the others are discarded.

When two or more NICs are installed on the virtual server

Specified IP addresses are allocated to the NICs in the following order: management-use IP address > second IP address > third IP address > fourth IP address. Specification of blank IP addresses is skipped. For example, if the management-use IP address, second IP address, and fourth IP address are specified (that is, the third IP address is not specified), the fourth IP address is allocated to the third NIC on the virtual server. If the number of specified IP addresses exceeds the number of NICs installed on the virtual server, the IP addresses that are not allocated to NICs are discarded.

5. The virtual server's (second to fourth) connection-destination virtual switches are set.

The connection-destination virtual switches that have already been set on the exported virtual server are replaced with the specified ones.

For the first NIC, set a management-use virtual switch that can communicate with the local server. For the second to fourth NICs, set a management-use or operation-use virtual switch according to the user operating needs.

If the number of specified virtual switches exceeds the number of NICs installed on the virtual server, only the virtual switches allocated to NICs are enabled.

6. A static route is set if the management-use IP address to be set in the OS of the virtual server is specified and two or more IP addresses are set for the virtual server.

7. If DOMAIN is selected from the selection list for the OS.selectWorkgroupDomain property, and the domain name, domain user name, and domain password are specified, processing to join the domain is executed.

The following gives notes on setting properties:

- a.** The OS user password must be entered twice (the second entry is for confirmation). If the OS user password is not entered twice, "Password123" is set as the password. This password is also set if the first entered and second entered passwords do not match.
- b.** If WORKGROUP is selected from the selection list for OS.selectWorkgroupDomain, the maximum length of the specifiable workgroup name is 15 bytes. If you specify a workgroup name longer than 15 bytes, the string "WORKGROUP" is set, instead of the specified name.

- c. If DOMAIN is selected from the selection list for the OS.selectWorkgroupDomain property, the domain name, domain user name, and domain password are required. If any values for these items are missing or domain participation fails, "WORKGROUP" is set as the workgroup name.
- d. Make sure to specify both the IP address and subnet mask. If you do not specify both of these items, the IP address, subnet mask and default gateway are not set.
- e. If the virtual switch specification is missing, connections to the virtual switches are not established.
- f. For the static route, specify the destination IP address, subnet mask and default gateway. If any of these items are missing, the static route is not set.
- g. Specifiable time zones are as follows:
 - Tokyo Standard Time
 - China Standard Time
 - GMT Standard Time
 - Pacific Standard Time
 - Eastern Standard Time
 - US Eastern Standard Time
 - Central Standard Time
 - Central America Standard Time
 - US Mountain Standard Time
 - Mountain Standard Time
 - Alaskan Standard Time
 - Hawaiian Standard Time
 - Singapore Standard Time
 - India Standard Time

If no time zone is specified, the time zone set in the exported virtual server is used.
- h. Specifiable locales are as follows:
 - ja-JP
 - en-US
 - zh-CN
- i. Specifiable OS names are as follows:
 - Windows Server 2012
 - Windows Server 2012 R2
 - Windows Server 2016

Service Definition and Submit Service Properties

The following table lists the properties shown in the **Service Definition** window for the service template.

Property key	Property name	Description
hyperv.targetHost ^R	Hyper-V server host name	Specifies the host name or IP address of the Hyper-V server. IPv6 addresses are not supported.
hyperv.userName ^O	User name for connecting to storage server	Specifies the user name for connecting to the storage server. Specify this property if the storage server is a server other than the Hyper-V server.
hyperv.password ^O	Password for connecting to storage server	Specifies the password for connecting to the storage server. Specify this property if the storage server is a server other than the Hyper-V server.
windows.orgName ^R	Organization name (company name)	Specify the organization name to be set in the OS of the virtual server.
windows.ownerName ^R	Name (owner name)	Specify the owner name to be set in the OS of the virtual server.
OS.selectWorkgroupDomain ^R	Select workgroup/domain	Select which type of entity you want the virtual server to belong to: workgroup or domain.
OS.workgroupNameDomainName ^R	Workgroup/domain name	Specify the name of the workgroup or domain that the virtual server belongs to. The workgroup name can have a maximum of 15 characters. The domain name can have a maximum of 63 characters.
OS.domainUserName ^O	Domain user name	Specify the user name for the domain that the virtual server belongs to. This item must be specified if DOMAIN is selected as the type of entity that you want the virtual server to belong to.
OS.domainUserPassword ^O	Domain password	Specify the password for the domain that the virtual server belongs to. This item must be specified if DOMAIN is selected as the type of entity that you want the virtual server to belong to.

Property key	Property name	Description
OS.subnetMaskMan [○]	Subnet mask (management LAN)	Specify the subnet mask for the management LAN of the virtual server. You cannot specify an IPv6 address.
OS.defaultGWMan [○]	Default gateway (management LAN)	Specify the default gateway for the management LAN of the virtual server. You cannot specify an IPv6 address.
OS.dnsMan [○]	DNS server IP address (management LAN)	Specify the IP address of the DNS server connected to the management LAN to be set on the virtual server. Do not specify an IPv6 address.
hyperv.virtualSwitchMan [○]	Virtual switch name (for management)	Specifies the virtual switch name (for management) set for the NIC (for management) that is set for the virtual server.
OS.subnetMask2 [○]	Subnet mask (for second NIC)	Specify the 2nd subnet mask for the virtual server. You cannot specify an IPv6 address.
OS.defaultGW2 [○]	Default gateway (for second NIC)	Specify the 2nd default gateway for the virtual server. You cannot specify an IPv6 address.
OS.dns2 [○]	DNS server IP address (for second NIC)	Specify the IP address of the DNS server to be set for the second NIC recognized by the OS of the virtual server. Do not specify an IPv6 address.
hyperv.virtualSwitch2 [○]	Virtual switch name (for second NIC)	Specifies the virtual switch name (for second NIC) set for the second NIC that is set for the virtual server.
OS.subnetMask3 [○]	Subnet mask (for third NIC)	Specifies the subnet mask that is set for the third NIC recognized by the OS on the virtual server. IPv6 addresses are not supported.
OS.defaultGW3 [○]	Default gateway (for third NIC)	Specifies the default gateway that is set for the third NIC recognized by the OS on the virtual server. IPv6 addresses are not supported.

Property key	Property name	Description
OS.dns3 ^O	DNS server IP address (for third NIC)	Specify the IP address of the DNS server to be set for the third NIC recognized by the OS of the virtual server. Do not specify an IPv6 address.
hyperv.virtualSwitch3 ^O	Virtual switch name (for third NIC)	Specifies the virtual switch name (for third NIC) set for the third NIC that is set for the virtual server.
OS.subnetMask4 ^O	Subnet mask (for fourth NIC)	Specifies the subnet mask that is set for the fourth NIC recognized by the OS on the virtual server. IPv6 addresses are not supported.
OS.defaultGW4 ^O	Default gateway (for fourth NIC)	Specifies the default gateway that is set for the fourth NIC recognized by the OS on the virtual server. IPv6 addresses are not supported.
OS.dns4 ^O	DNS server IP address (for fourth NIC)	Specify the IP address of the DNS server to be set for the fourth NIC recognized by the OS of the virtual server. Do not specify an IPv6 address.
hyperv.virtualSwitch4 ^O	Virtual switch name (for fourth NIC)	Specifies the virtual switch name (for fourth NIC) set for the fourth NIC that is set for the virtual server.
OS.destIPAddress ^O	Destination IP of static route	Specify the static-route destination IP address. Do not specify an IPv6 address.
OS.subnetMaskStaticRoute ^O	Subnet mask (static route)	Specify the subnet mask for the static route. You cannot specify an IPv6 address.
OS.defaultGWStaticRoute ^O	Default gateway (static route)	Specify the default gateway for the static route. You cannot specify an IPv6 address.
hyperv.scsiDiskLocation ^R	SCSI controller location	Specify the location of the SCSI controller for which a system disk has been set. This property takes effect only if the generation number of the exported virtual server is 2.
hyperv.osSettingWaitTime ^R	Wait time before initial OS setup finishes	Specify in seconds the time to wait before initial OS setup finishes.

Property key	Property name	Description
common.icmpEchoTimeout ^R	Timeout period for ICMP echo requests	To verify network connectivity, specify in milliseconds the time to wait for a reply to an ICMP echo request performed after the virtual server starts.
hyperv.checkVmStateEnabledCount ^R	Virtual server status (startup complete) check count	Specifies the number of times to verify whether virtual server startup is complete. This value combined with the verification interval for the virtual server status (startup complete) determines the maximum wait time.
hyperv.checkVmStateEnabledInterval ^R	Virtual server status (startup complete) check interval	Specifies the interval in seconds between verifications for whether virtual server startup is complete.
hyperv.checkJobStateCountGetDriveList ^R	Job monitoring count (Win32_LogicalDisk method)	This property adjusts the job monitoring count for monitoring requests to Hyper-V for processing (Win32_LogicalDisk method). You do not need to change the value of this property.
hyperv.checkJobStateIntervalGetDriveList ^R	Job monitoring interval (Win32_LogicalDisk method)	This property adjusts the job monitoring interval for monitoring requests to Hyper-V for processing (Win32_LogicalDisk method). You do not need to change the value of this property.
<p>O: The property can be omitted. However, the property might be mandatory depending on what is specified for other properties. See the Description of each property.</p> <p>R: Required</p>		

The following table lists the properties shown in the **Service Definition** and the **Submit Service** windows:

Property key	Property name	Description
hyperv.vmName ^R	Virtual server name	Specifies the name of the virtual server. (This is the name of the virtual server as it is displayed in Hyper-V. This is not the host name in the OS.)
hyperv.exportedVmName ^R	Path of exported virtual server folder	Specifies the folder name, as a full path, of the exported virtual server that is used as the copy source of the virtual server. If the storage server is a server other than the Hyper-V server, specify the path in UNC syntax.
hyperv.importFolderPath ^R	Import target	Specifies the full path of the folder where the virtual server is stored.
windows.operatingSystem ^R	Operating system	Specifies the operating system (OS) of the virtual server.
OS.computerName ^R	Computer/host name	Specify the computer name (host name) in the OS.
OS.osUserPassword ^O	Administrator password	Enter the administrator password to be set in the OS. If you enter nothing, "Password123" is set.
OS.osUserPasswordReEnter ^O	Enter administrator password again	Re-enter the administrator password to be set in the OS. If you enter nothing, "Password123" is set.
OS.productKey ^O	OS product key	Specify the OS product key in the following format: XXXXXX-XXXXXX-XXXXXX-XXXXXX-XXXXXX
OS.ipAddressMan ^O	IP address (management LAN)	Specify the IP address for the management LAN of the virtual server. You cannot specify an IPv6 address.

Property key	Property name	Description
OS.ipAddress2 ^O	IP address (for second NIC)	Specify the 2nd IP address for the virtual server. You cannot specify an IPv6 address.
OS.ipAddress3 ^O	IP address (for third NIC)	Specifies the IP address that is set for the third NIC recognized by the OS on the virtual server. IPv6 addresses are not supported.
OS.ipAddress4 ^O	IP address (for fourth NIC)	Specifies the IP address that is set for the fourth NIC recognized by the OS on the virtual server. IPv6 addresses are not supported.
OS.timeZoneWin ^O	Time zone	Specify the time zone to be set in the OS of the virtual server.
OS.systemLocale ^R	System locale	Specifies the system locale that is set for the OS of the virtual server.
<p>O: The property can be omitted. However, the property might be mandatory depending on what is specified for other properties. See the Description of each property.</p> <p>R: Required</p>		

Prerequisites

Conditions related to the settings on the Hyper-V server:

- Virtual switch settings must have been specified.
- Each virtual switch name must be unique within the Hyper-V server.
- An exported virtual server to be deployed must have been created.

Conditions related to the exported virtual server to be deployed:

- The following service of Hyper-V Integration Service must be enabled: Data Exchange
- Before a virtual server is exported from the Hyper-V server, the virtual server must satisfy the following conditions:
 - The administrator user password is blank.
 - The network settings are deleted.

If the network adapter settings have been specified on the virtual host, make sure that the values of the following settings are blank, and then set Obtain an IP address automatically and Obtain DNS server address automatically:

- IP address
- Subnet mask
- Default gateway
- Preferred DNS server
- Alternate DNS server

The OS settings must have been initialized by using Sysprep and the following conditions must be satisfied:

- [Select Enter System Out of Box Experience (OOBE) from System Cleanup Action list.
- Select the Generalize check box.
- Agentless connection must be possible.
- A maximum of four NICs must be set up.
- Connections with virtual switches must be closed.
- The firewall must permit ICMP (ECHO) replies.
- If the container server and the Hyper-V server are different, the folder containing the virtual server exported from the Hyper-V server must be a shared folder.
- No legacy network adapter must be set.
- Snapshots and differential disks must not be created.

Conditions related to the settings on the virtual server:

- The virtual server name must be unique within the Hyper-V server.

Conditions related to this product settings:

- For the following addresses, authentication information must have been set in the agentless connection definition on the Management tab: the local server address (a loopback address that can be resolved from the name "localhost"), Hyper-V server address, and the management-use IP address of the virtual server to be deployed.

Server requirements

- **Hyper-V server**
A server on which Hyper-V is installed.
- **Virtual server**
A virtual server managed by Hyper-V.
- **Exported virtual server**
A virtual server and its full set of configuration files
- **Container server**
A server that contains an exported virtual server to be replicated.

Usage guidelines

- If no virtual switch is specified, the connection-destination virtual switch information of the relevant NIC is deleted. As a result, the NIC is disconnected from the virtual switch. Make sure to specify all necessary virtual switches.
- For IP addresses to be set in the OS of the virtual server, enter only values that are treated as IP addresses. For example, you must not specify special addresses such as a network address, broadcast address, "0.0.0.0", or "255.255.255.255". If you enter such a special address, deployment of the virtual server fails. In addition, for management-use IP addresses, enter IP addresses that allow communication with the local server. If you enter an address that is correct but does not allow communication with the local server, deployment might fail.
- While the virtual server is being deployed, make sure that other services do not operate the virtual server. If other services operate the virtual server that is being deployed, deployment might fail. Direct operation from the Hyper-V server is also prohibited.
- IP addresses are set as described in the Function Specifications. However, depending on the order in which NICs are set in the OS of the virtual server, IP addresses might not be set as intended. Therefore, after the virtual server has been created, verify whether IP addresses are set as intended. If IP addresses are not set as intended, correct the settings manually.
- Make sure that IP addresses set on the virtual server are not being used by other servers. If an IP address that is set on another server is set, no NICs on the virtual server are enabled, sometimes causing the task to end abnormally.

- Make sure that the settings to be specified during creation of the virtual server to be deployed have not been set on the exported virtual server. If the computer name, host name, or IP address has already been set on the exported virtual server, virtual server creation might fail (for example, an error occurs in static-route related processing). If creation fails, delete the virtual server, re-create an exported virtual server on which the computer name, host name, or IP address is not set, and then re-execute this service.
- If deployment fails, the response file used to specify the initial OS settings and IP addresses on the virtual server might remain on the system drive of the virtual server. If a response file remains, look for the relevant response file in the task log, and delete the file. Alternatively, delete the virtual server.
- If folders in the specified import destination path do not exist, they are created.
- If virtual disk files remain in folders in the specified import destination path, the task ends abnormally. Look for the folders in the specified path, and then delete them or specify another path.
- This service does not register virtual servers deployed for any services and applications of the failover cluster manager. Register those servers manually according to the user operating needs.
- When virtual disks on a virtual server are mounted to the Hyper-V server, available drive letters on the Hyper-V server are temporarily locked. If there are no available drive letters, an error occurs when the virtual disk is being mounted, and the task ends abnormally. Before you execute this service, make sure that there are as many available drive letters on the Hyper-V server as the number of drives used by the virtual disks on the exported virtual server.
- If the generation number of the exported virtual server is 2, for the `hyperv.scsiDiskLocation` property, specify the location of the SCSI controller in which the virtual server's system disk is set. If the location of the system disk differs from the location specified for that property, a search for the system disk takes place. In this case, therefore, a longer time might be required to complete deployment.
- Do not change the value of the `hyperv.osSettingWaitTime` property from the default value. Note, however, that if the wait time specified for the property is not long enough, the next step might start before the initial OS setup finishes, causing the task to end abnormally.
- In this service template, drive letter of drive connected to the deployed virtual server might be changed, to initialize the system information of the OS by sysprep. So that the drive letter might not match between the deployed virtual server and template of the virtual server. Also if the application has been installed on the drive where the drive letter has been changed, there is a possibility that the application might not work correctly.

Add a virtual server (virtual disk): Service details

This service template creates a virtual disk in a Hyper-V environment and then adds that virtual disk to a virtual server.

The general steps for using this service template are as follows:

1. The task obtains the status of the virtual server.

2. The task confirms that the virtual server is not running.

If the virtual server is not running, the task continues processing. In all other cases, the task runs the User-Response Wait plug-in to verify whether the virtual server is to be shut down.

If you select Shutdown from the UI of the User-Response Wait plug-in, the virtual server is shut down. If you select Shutdown for a virtual server that is not running, the task ends abnormally without making any changes on the virtual server.

If you select Cancel or the wait for a user response times out, the task ends abnormally without making any changes on the virtual server.

3. The task creates a virtual disk file in the Hyper-V environment.

The task can create dynamic (variable-size) or fixed (fixed-size) virtual disks. It cannot create differential virtual disks or pass-through (physical) disks.

If you specify the property `hyperv.vHardDiskFolderPath`, a new virtual disk file is created in the folder path specified by the property. If you do not specify this property, a new virtual disk is saved in the default virtual-disk storage folder set on the Hyper-V server.

If you specify a path that includes non-existent folders, those folders are automatically created.

4. The task connects the virtual disk to the virtual server.

You can add virtual disks to a SCSI controller but not to an IDE controller.

The method for connecting a virtual disk to a SCSI controller varies depending on whether the SCSI controller ID number (the property `hyperv.scsiControllerNumber`) and SCSI controller location number (the property `hyperv.scsiLocationNumber`) are specified.

- If neither the SCSI controller ID number nor SCSI controller location number is specified:

The Hyper-V server automatically connects the virtual disk to an available SCSI controller.

- If only the SCSI controller ID number is specified:

The Hyper-V server automatically connects the virtual disk to any location (0 to 63) of the specified SCSI controller.

- If only the SCSI controller location number is specified:

The Hyper-V server automatically connects the virtual disk to the specified SCSI controller location of an available SCSI controller (0 to 3).

- If both the SCSI controller ID number and SCSI controller location number are specified:

The virtual disk is connected to the specified location of the specified SCSI controller.

Service Definition and Submit Service Properties

The following table lists the properties shown in the **Service Definition** window for the service template.

Property key	Property name	Description
hyperv.targetHost ^R	Hyper-V server host name	Specifies the host name or IP address of the Hyper-V server. IPv6 addresses are not supported.
UserResponsePlugin.toAddress ^O	TO addresses	Specify the email addresses to enter in the TO field of notification emails sent when the service is waiting for a user response. Separate multiple addresses with commas. For example: mailA,mailB
UserResponsePlugin.ccAddress ^O	CC addresses	Specify the email addresses to enter in the CC field of notification emails sent when the service is waiting for a user response. Separate multiple addresses with commas. For example: mailA,mailB
UserResponsePlugin.bccAddress ^O	BCC addresses	Specify the email addresses to enter in the BCC field of notification emails sent when the service is waiting for a user response. Separate multiple addresses with commas. For example: mailA,mailB
UserResponsePlugin.mailSubject ^O	Subject line	Specify the subject line of notification emails sent when the service is waiting for a user response.
UserResponsePlugin.mailBody ^O	Email text	Specify the body text of notification emails sent when the service is waiting for a user response.
UserResponsePlugin.encodeType ^O	Additional dialog box text	Enter additional text to appear in the response input dialog box, in text or HTML format. Supported HTML tags are anchor tags, bold tags, break tags, font tags, italics tags, and underline tags.
UserResponsePlugin.dialogText ^O	Domain user name	Specify the user name for the domain that the virtual server belongs to. This item must be specified if DOMAIN is selected as the type of entity that you want the virtual server to belong to.

Property key	Property name	Description
UserResponsePlugin.responseTimeout ^R	Response timeout time (minutes)	Specify how long (in minutes) the service waits for a user response before timing out. In the event of a response timeout, the service will end abnormally.
<p>O: The property can be omitted. However, the property might be mandatory depending on what is specified for other properties. See the Description of each property.</p> <p>R: Required</p>		

The following table lists the properties shown in the **Service Definition** and the **Submit Service** windows:

Property key	Property name	Description
hyperv.vmName ^R	Virtual server name	Specifies the name of the virtual server. (This is the name of the virtual server as it is displayed in Hyper-V. This is not the host name in the OS.)
hyperv.vHardDiskName ^R	Virtual Disk File Name	Specify the file name of the virtual disk to be created. Specify "vhd" or "vhdx" as the file extension.
hyperv.vHardDiskFolderPath ^O	Virtual disk storage folder path	Specify the full path to the folder that stores the created virtual disk. If you omit this specification, the virtual disk is stored in the virtual disk folder specified for the Hyper-V server.
hyperv.vHardDiskType ^R	Virtual disk type	Specifies the virtual disk type. Specify one of the following: dynamic (an adjustable-size virtual disk is created) or fixed (a fixed-size virtual disk is created).
hyperv.capacity ^R	Size (GB)	Specifies the size of the virtual disk, in gigabytes (GB).

Property key	Property name	Description
hyperv.scsiControllerNumber ^O	SCSI controller number	Specifies the SCSI controller number of the virtual server that adds the virtual disk. Specify the SCSI controller number as an integer from 0 in the order that the SCSI controllers were added to the virtual server (displayed in the Hyper-V Manager).
hyperv.scsiLocationNumber ^O	SCSI controller location number	Specifies the location number of the SCSI controller of the virtual server that adds the virtual disk. Specify the SCSI controller location number as an integer for the unused locations of SCSI controllers that were added to the virtual server.
<p>O: The property can be omitted. However, the property might be mandatory depending on what is specified for other properties. See the Description of each property.</p> <p>R: Required</p>		

Prerequisites

- The name of each virtual server on the Hyper-V server must be unique.
- The Operating System Shutdown service of Hyper-V Integration Services must be enabled on the target virtual server.
- There must be an available SCSI controller on the virtual server.

Server requirements

- Hyper-V server
A server on which Hyper-V is installed.
- Virtual server
A virtual server managed by Hyper-V.

Usage guidelines

- This service template does not initialize the virtual disks that are added to the virtual server. If necessary, log in to the OS of the virtual server and initialize the disks.
- Do not concurrently run multiple instances of this service on the same virtual server.
- You can specify HTML tags for the property UserResponseplugin.dialogText. The specifiable tags and attributes are the same as those for the User-Response Wait plug-in. For details, see "User-Response Wait Plug-in" in the *Hitachi Ops Center Automator Service Builder User Guide*.

- You cannot add any virtual disk files that have already been created on a Hyper-V server.
- If you select Shutdown from the UI of the User-Response Wait plug-in, the OS of the virtual server is forcibly shut down. Data in files that are being edited on the virtual server will not be saved.
- If another virtual disk is already connected to the specified SCSI controller location of the specified SCSI controller, this task ends abnormally.
- For second-generation virtual servers, you can add only virtual disks that are in VHDX file format. If you try to connect a created VHD file to a second-generation virtual server, this task ends abnormally.

Change virtual server specifications (CPU and memory): Service details

This service template changes the specified resource settings (CPU and memory) of a virtual server in a Hyper-V environment.

The general steps for using this service template are as follows:

1. The service asks whether CPU and memory settings are to be changed. If you do not want to change either the CPU settings or the memory settings, the service ends abnormally.
2. The service makes sure that the virtual server is stopped.

If the virtual server is running, the User-Response Wait plug-in to verify whether the virtual server is to be shut down.

Users who have Modify permission can use this plug-in to specify an email destination, message, timeout value, and information to be displayed.

If you select Shutdown from the UI of the User-Response Wait plug-in, the virtual server is shut down.

If you select Cancel or the response-wait processing times out, the task ends abnormally without changing the virtual server specifications.

3. The target settings for the CPU and memory resources of the virtual server are changed. The settings that can be changed are as follows:

- CPU settings that can be changed:
 - Number of virtual processors
 - Number of reserved virtual processor resources
 - Maximum number of virtual processor resources
 - Relative Weight setting of virtual processor resources
 - Processor compatibility
 - Maximum number of processors that can be used on a NUMA node
 - Maximum number of NUMA nodes that can be used by a socket
- Memory settings that can be changed:
 - Startup RAM (MB)
 - Whether to enable dynamic memory
 - Minimum RAM for dynamic memory (MB)
 - Maximum RAM for dynamic memory (MB)
 - Buffer for dynamic memory
 - Memory weight
 - Maximum size of memory available on a NUMA node (MB)

Service Definition and Submit Service Properties

The following table lists the properties shown in the **Service Definition** window for the service template.

Property key	Property name	Description
hyperv.targetHost ^R	Hyper-V server host name	Specifies the host name or IP address of the Hyper-V server. IPv6 addresses are not supported.
UserResponsePlugin.toAddress ^O	TO addresses	Specify the email addresses to enter in the TO field of notification emails sent when the service is waiting for a user response. Separate multiple addresses with commas. For example: mailA,mailB

Property key	Property name	Description
UserResponsePlugin.ccAddress [○]	CC addresses	Specify the email addresses to enter in the CC field of notification emails sent when the service is waiting for a user response. Separate multiple addresses with commas. For example: mailA,mailB
UserResponsePlugin.bccAddress [○]	BCC addresses	Specify the email addresses to enter in the BCC field of notification emails sent when the service is waiting for a user response. Separate multiple addresses with commas. For example: mailA,mailB
UserResponsePlugin.mailSubject [○]	Subject line	Specify the subject line of notification emails sent when the service is waiting for a user response.
UserResponsePlugin.mailBody [○]	Email text	Specify the body text of notification emails sent when the service is waiting for a user response.
UserResponsePlugin.encodeType [○]	Encoding	Specify the encoding of notification emails sent when the service is waiting for a user response. The encodings you can specify are us-ascii, iso-2022-jp, shift_jis, euc-jp, and utf-8. If you omit this property, utf-8 is set.
UserResponsePlugin.dialogText [○]	Additional dialog box text	Enter additional text to appear in the response input dialog box, in text or HTML format. Supported HTML tags are anchor tags, bold tags, break tags, font tags, italics tags, and underline tags.

Property key	Property name	Description
UserResponsePlugin.responseTimeout ^R	Response timeout time (minutes)	Specify how long (in minutes) the service waits for a user response before timing out. In the event of a response timeout, the service will end abnormally.
<p>O: The property can be omitted. However, the property might be mandatory depending on what is specified for other properties. See the Description of each property.</p> <p>R: Required</p>		

The following table lists the properties shown in the **Service Definition** and the **Submit Service** windows:

Property key	Property name	Description
hyperv.vmName ^R	Virtual server name	Specifies the name of the virtual server. (This is the name of the virtual server as it is displayed in Hyper-V. This is not the host name in the OS.)
hyperv.selectVmCpuChange ^R	Whether to change the virtual server CPU settings	To change the virtual server CPU settings, select "yes". If you do not want to change the virtual server CPU settings, select "no".
hyperv.selectVmMemoryChange ^R	Whether to change the virtual server memory settings	To change the virtual server memory settings, select "yes". If you do not want to change the virtual server memory settings, select "no".
hyperv.cpuCount ^O	Number of virtual processors	Specify the number of virtual processors to be set on a virtual server. Specify an integer of 1 or greater.

Property key	Property name	Description
hyperv.cpuReserve [○]	Number of reserved virtual processor resources	Specify the number of virtual processor resources reserved by each virtual server. Specify an integer that does not exceed "Maximum number of virtual processor resources" within the range from 0 to 100.
hyperv.cpuMaximum [○]	Maximum number of virtual processor resources	Specify the maximum number of virtual processor resources that can be used by each virtual server. Specify an integer that is equal to or greater than "Number of reserved virtual processor resources" within the range from 0 to 100.
hyperv.cpuRelativeWeight [○]	Relative weight of virtual processor resources	Specify the relative weight of virtual processor resources among virtual servers. Specify an integer in the range from 0 to 10,000.
hyperv.cpuCompatibilityForMigrationEnabled [○]	Processor compatibility	To enable processor compatibility, specify "true". To disable processor compatibility, specify "false". If specification is omitted, the current setting does not change.
hyperv.cpuMaximumCountPerNumaNode [○]	Maximum number of processors that can be used on a NUMA node	Specify the maximum number of processors that can be used on a virtual NUMA (Non-Uniform Memory Architecture) node. Specify an integer of 1 or greater.
hyperv.nodeMaximumCountPerNumaSocket [○]	Maximum number of NUMA nodes that can be used by a socket	Specify the maximum number of virtual NUMA (Non-Uniform Memory Architecture) nodes that can be used by one socket. Specify an integer of 1 or greater.

Property key	Property name	Description
hyperv.memoryStartupMegaBytes [○]	Startup RAM (MB)	Specify (in MB) the amount of memory to be used during the startup of the virtual server. Specify an integer of 8 or greater that is a multiple of 2.
hyperv.dynamicMemoryEnabled [○]	Whether to enable dynamic memory	To enable dynamic memory on the virtual server, specify "true". To disable dynamic memory on the virtual server, specify "false". If specification is omitted, the current setting does not change.
hyperv.dynamicMemoryMinimumMegaBytes [○]	Minimum RAM for dynamic memory (MB)	Specify (in MB) the minimum amount of dynamic memory. Specify a multiple of 2 in the range from 8 to the "Startup RAM" value. Specify this item only when dynamic memory is enabled.
hyperv.dynamicMemoryMaximumMegaBytes [○]	Maximum RAM for dynamic memory (MB)	Specify (in MB) the maximum amount of dynamic memory. Specify a multiple of 2 that is not smaller than 8 and the "Startup RAM" value. Specify this item only when dynamic memory is enabled.
hyperv.dynamicMemoryBuffer [○]	Buffer for dynamic memory	Specify the percentage of memory to be reserved as the buffer for dynamic memory of Hyper-V. Specify an integer in the range from 5 to 2,000. Specify this item only when dynamic memory is enabled.
hyperv.memoryPriority [○]	Memory weight	Specify the priority that is applied when available memory is allocated to multiple virtual servers. Specify an integer in the range from 0 to 100.

Property key	Property name	Description
hyperv.memoryMaximumAmountMegaBytesPerNumaNode	Maximum size of memory available on a NUMA node (MB)	Specify (in MB) the maximum amount of memory that can be used on a virtual NUMA (Non-Uniform Memory Architecture) node. Specify an integer of 8 or greater.
<p>O: The property can be omitted. However, the property might be mandatory depending on what is specified for other properties. See the Description of each property.</p> <p>R: Required</p>		

Prerequisites

The name of each virtual server on the Hyper-V server must be unique within a single Hyper-V server.

Server requirements

- Hyper-V server
A server on which Hyper-V is installed.
- Virtual server
A virtual server managed by Hyper-V.

Usage guidelines

- Do not run multiple instances of this service simultaneously on the same virtual server.
- You can use certain HTML tags when specifying the property `UserResponseplugin.dialogText`. The tags and attributes that can be used are the same as those that can be used for the User-Response Wait plug-in. For details, see "User-Response Wait Plug-in" in the *Hitachi Ops Center Automator Service Builder User Guide*.
- The maximum number of virtual processors that can be set for a virtual server differs depending on the Hyper-V server.
- The values that can be specified for the memory-related settings of a virtual server differ depending on the Hyper-V server.
- If the service ends abnormally, some CPU or memory settings might have been changed.
- If you select "yes" for the property `hyperv.selectVmCpuChange` and then run the service without entering a value for any CPU-related setting, the service ends abnormally. Similarly, if you select "yes" for the property `hyperv.selectVmMemoryChange` and then run the service without entering a value for any memory-related setting, the service ends abnormally.
- If you select "Shutdown" from the UI of the User-Response Wait plug-in, the virtual server shuts down. Data in the files that are currently being edited on the virtual server will not be saved.

Delete virtual server: Service details

This service template creates a virtual disk in a Hyper-V environment and then adds that virtual disk to a virtual server.

The general steps for using this service template are as follows:

1. The task obtains the status of the virtual server.
2. The task confirms that the virtual server is not running.

If the virtual server is not running, the task continues processing. In all other cases, the task runs the User-Response Wait plug-in to verify whether the virtual server is to be shut down.

If you select Shutdown from the UI of the User-Response Wait plug-in, the virtual server is shut down. If you select Shutdown for a virtual server that is not running, the task ends abnormally without making any changes on the virtual server.

If you select Cancel or the wait for a user response times out, the task ends abnormally without making any changes on the virtual server.

3. The task deletes the virtual server.

The virtual server is deleted from the Hyper-V server. At this time, all snapshots for that virtual server are also deleted.

If you select "yes" from the selection list for the `hyperv.vHardDiskDeletePermanently` property, the task deletes all (dynamic, fixed, and differential) virtual disk files that are allocated to the virtual server that is to be deleted. The task does not delete disks or files that are allocated to pass-through (physical) disks, floppy disks, CDs or DVDs. If differential virtual disks are allocated to the virtual server, the task does not delete the virtual disks that are used as the parents of those differential virtual disks.

If trying to delete virtual disk files on the virtual server fails, the file deletion processing stops, and the task ends abnormally.

4. The task outputs a list of virtual disk files on the virtual server.

If you specify the `hyperv.vhdListOutputFileNameRemote` and `hyperv.vhdListOutputFileNameLocal` properties, the task outputs a CSV file that lists the paths of the virtual disk files allocated to the virtual server that is to be deleted from the Hyper-V server. The task then transfers the CSV file to the local PC and deletes the CSV file from the remote PC. If differential virtual disks are allocated to the virtual server, the virtual disks that are used as the parents of those differential virtual disks are not included in the CSV file.

If you only specify the `hyperv.vhdListOutputFileNameRemote` property, the task outputs a CSV file that lists the paths of the virtual disk files, but does not transfer the CSV file to the local PC.

The following items are output to the file in CSV (comma-separated value) format:

- a. Whether virtual disk files exist (header name: Existence)

Depending on whether virtual disk files are allocated to the virtual server when the server is deleted, one of the following values is output:

- Found: Existence of virtual disk files was confirmed.
- NotFound: Virtual disk files were set up, but their existence were not confirmed.

b. File deletion result (header name: DeleteResult)

If you select "yes" from the selection list for the hyperv.vHardDiskDeletePermanently property, the task outputs the result of deleting the virtual disk files. If you select "no", "Skipped" is output. For the deletion result, one of the following values is output:

- Completed: File deletion finished successfully.
- Failed: File deletion failed.
- Skipped: File deletion was not performed.

c. File path (header name: FilePath)

The paths of the virtual disk files set for the Hyper-V server are output, regardless of the values in (a) and (b).

Service Definition and Submit Service Properties

The following table lists the properties shown in the **Service Definition** window for the service template.

Property key	Property name	Description
hyperv.targetHost ^R	Hyper-V server host name	Specifies the host name or IP address of the Hyper-V server. IPv6 addresses are not supported.
UserResponsePlugin.to Address ^O	TO addresses	Specify the email addresses to enter in the TO field of notification emails sent when the service is waiting for a user response. Separate multiple addresses with commas. For example: mailA,mailB
UserResponsePlugin.cc Address ^O	CC addresses	Specify the email addresses to enter in the CC field of notification emails sent when the service is waiting for a user response. Separate multiple addresses with commas. For example: mailA,mailB

Property key	Property name	Description
UserResponsePlugin.bccAddress ^O	BCC addresses	Specify the email addresses to enter in the BCC field of notification emails sent when the service is waiting for a user response. Separate multiple addresses with commas. For example: mailA,mailB
UserResponsePlugin.mailSubject ^O	Subject line	Specify the subject line of notification emails sent when the service is waiting for a user response.
UserResponsePlugin.mailBody ^O	Email text	Specify the body text of notification emails sent when the service is waiting for a user response.
UserResponsePlugin.encodeType ^O	Additional dialog box text	Enter additional text to appear in the response input dialog box, in text or HTML format. Supported HTML tags are anchor tags, bold tags, break tags, font tags, italics tags, and underline tags.
UserResponsePlugin.domainLogText ^O	Domain user name	Specify the user name for the domain that the virtual server belongs to. This item must be specified if DOMAIN is selected as the type of entity that you want the virtual server to belong to.
UserResponsePlugin.responseTimeout ^R	Response timeout time (minutes)	Specify how long (in minutes) the service waits for a user response before timing out. In the event of a response timeout, the service will end abnormally.
<p>O: The property can be omitted. However, the property might be mandatory depending on what is specified for other properties. See the Description of each property.</p> <p>R: Required</p>		

The following table lists the properties shown in the **Service Definition** and the **Submit Service** windows:

Property key	Property name	Description
hyperv.vmName ^R	Virtual server name	Specifies the name of the virtual server. (This is the name of the virtual server as it is displayed in Hyper-V. This is not the host name in the OS.)
hyperv.vHardDiskDelete Permanently ^R	Deletion of virtual disk file required	Specifies whether to delete virtual disk file used for the virtual server.
hyperv.vhdListOutputFileNameRemote ^O	Output file name (remote)	Specifies, as a full path, the temporary file name for when the virtual disk file list used by the virtual server is output to the Hyper-V server.
hyperv.vhdListOutputFileNameLocal ^O	Output file name (local)	Specifies the name of the file (in full-path format) that contains the list of virtual disk files to be saved to the local server.
<p>O: The property can be omitted. However, the property might be mandatory depending on what is specified for other properties. See the Description of each property.</p> <p>R: Required</p>		

Prerequisites

- The name of each virtual server on the Hyper-V server must be unique.
- The Operating System Shutdown service of Hyper-V Integration Services must be enabled on the target virtual server.

Server requirements

- Hyper-V server
A server on which Hyper-V is installed.
- Virtual server
A virtual server managed by Hyper-V.

Usage guidelines

- Do not concurrently run multiple instances of this service on the same virtual server.
- If you previously performed a task (such as a snapshot-related procedure) to make the path of a virtual disk file invisible in the virtual server settings, this service will not delete that virtual disk file. In such a case, manually delete the virtual disk file.

- You can specify HTML tags for the property `UserResponseplugin.dialogText`. The specifiable tags and attributes are the same as those for the User-Response Wait plug-in. For details, see "User-Response Wait Plug-in" in the *Hitachi Ops Center Automator Service Builder User Guide*.
- If you specify an existing file for the `hyperv.vhdListOutputFileNameRemote` or the `hyperv.vhdListOutputFileNameLocal` properties, the existing file is overwritten. In addition, the file on the remote PC will be deleted, so make sure the specified file name is correct.
- If you specify a path that includes non-existent folders for the `hyperv.vhdListOutputFileNameRemote` property, those folders are automatically created but not automatically deleted. Periodically delete these folders if they are unnecessary.
- If you specify the `hyperv.vhdListOutputFileNameRemote` property, a file is output to the remote PC even if the `hyperv.vhdListOutputFileNameLocal` property is not specified or if an error occurs during the deletion of the virtual server or virtual disk file. Because this service does not delete the output file, manually delete the file if it is unnecessary.
- This service does not delete the registration information of virtual servers from any services and applications of the failover cluster manager. Manually delete the registration information based on the user operational requirements.
- If you select "Shutdown" from the UI of the User-Response Wait plug-in, the OS of the virtual server is forcibly shut down. Data in files that are being edited on the virtual server will not be saved.

Obtain virtual server information list: Service details

This service template obtains a list of information about virtual servers in a Hyper-V environment.

The general steps for using this service template are as follows:

1. A list of virtual server information is output to a temporary file in CSV format on the specified remote PC. The file is encoded in the default encoding of the system on the Hyper-V server.
2. The temporary file on the remote PC is transferred to an output file on the local PC.
3. The temporary file on the remote PC is deleted.

The following items are output to the file in CSV (comma-separated value) format:

- Name of the Hyper-V server (header name: `ComputerName`)
- Name of the virtual server (header name: `VMName`)
- State of the virtual server (header name: `State`)
- CPU usage (%) of a virtual server (header name: `CPUUsage`)
- Size of the memory (in MB) allocated to the virtual server (header name: `MemoryAssigned`)
- Running time of the virtual server (header name: `Uptime`)
- Status of the virtual server (header name: `Status`)
- Number of virtual processors on the virtual server (header name: `ProcessorCount`)

- Startup RAM (in MB) of the virtual server (header name: MemoryStartup)
- Whether dynamic memory is enabled on the virtual server (header name: DynamicMemoryEnabled)

Service Definition and Submit Service Properties

The following table lists the properties shown in the **Service Definition** window for the service template.

Property key	Property name	Description
hyperv.targetHost ^R	Hyper-V server host name	Specifies the host name or IP address of the Hyper-V server. IPv6 addresses are not supported.
R: Required		

The following table lists the properties shown in the **Service Definition** and the **Submit Service** windows:

Property key	Property name	Description
hyperv.listOutputFileNameRemote ^R	Output file name (remote)	Specifies, as a full path, the temporary file name for when virtual server information is output to the Hyper-V server.
hyperv.exportedVmName ^R	Output file name (local)	Specifies the name of the file (in full-path format) that contains the virtual server information to be saved to the local server.
R: Required		

Server requirements

- Hyper-V server
A server on which Hyper-V is installed.
- Virtual server
A virtual server managed by Hyper-V.

Usage guidelines

- If you specify an existing file for the remote or local file, the existing file will be overwritten. In addition, the file on the remote PC will be deleted, so make sure the specified file name is correct.
- If you specify a remote file path that includes non-existent folders, those folders are automatically created. These folders are not automatically deleted. Periodically delete these folders if they are unnecessary.
- If two or more virtual servers have the same name, you will not be able to distinguish these virtual servers in the output CSV file.

Restart virtual server: Service details

This service template starts multiple virtual servers in a Hyper-V environment.

The general steps for using this service template are as follows:

1. For a virtual server that is running, this service template restarts the virtual server. For a virtual server in any state other than the running state, processing for that virtual server ends in an error.
2. If the network connectivity verification is enabled, the IP address (IPv4) set for the virtual server that was started is obtained. Then the local server sends an ICMP echo request to that server to verify whether it is connected to the network.

This processing is run in parallel for the specified virtual servers.

Before a virtual server is started, a verification of the virtual server status is performed for the number of times specified by the `hyperv.checkVmStateEnabledCount` property, at the interval specified (in seconds) by the `hyperv.checkVmStateEnabledInterval` property. Adjust the values of these properties based on your environmental needs.

Service Definition and Submit Service Properties

The following table lists the properties shown in the **Service Definition** window for the service template.

Property key	Property name	Description
<code>hyperv.targetHost</code> ^R	Hyper-V server host name	Specifies the host name or IP address of the Hyper-V server. IPv6 addresses are not supported.
<code>hyperv.waitTime</code> ^R	Wait time before starting to obtain IP address	When performing a network connectivity verification, specifies the amount of time, in seconds, after the virtual server starts to wait before starting to obtain the IP address.

Property key	Property name	Description
common.icmpEchoTimeout ^R	Timeout period for ICMP echo requests	Specify in milliseconds how long the service waits for a reply to an ICMP echo request sent to confirm startup of a virtual server.
hyperv.checkVmStateEnable dCount ^R	Virtual server status (startup complete) check count	Specifies the number of times to verify whether virtual server startup is complete. This value combined with the verification interval for the virtual server status (startup complete) determines the maximum wait time.
hyperv.checkVmStateEnable dInterval ^R	Virtual server status (startup complete) check interval	Specifies the interval in seconds between verifications for whether virtual server startup is complete.
<p>O: The property can be omitted. However, the property might be mandatory depending on what is specified for other properties. See the Description of each property.</p> <p>R: Required</p>		

The following table lists the properties shown in the **Service Definition** and the **Submit Service** windows:

Property key	Property name	Description
hyperv.foreachVmName ^R	Virtual server names (multiple names can be specified.	Specifies one or more names for the virtual server. (This is the name of the virtual server as it is displayed in Hyper-V. This is not the host name in the OS.) If specifying multiple names, separate them with commas. You can specify up to 99 names.
hyperv.checkNetworkConne ction ^R	Check network connectivity.	Specifies whether to verify network connectivity after starting a virtual server.

Property key	Property name	Description
O: The property can be omitted. However, the property might be mandatory depending on what is specified for other properties. See the Description of each property.		
R: Required		

Prerequisites

- The name of each virtual server on the Hyper-V server must be unique.
- The Operating System Shutdown and Data Exchange services of Hyper-V Integration Service on the target virtual server must be enabled.
- If the network connectivity verification is enabled, the local server (the loopback address resolved from the name "localhost") must be set as the agentless connection destination.
- If the network connection verification is enabled, the firewall for the target virtual server must permit ICMP (ECHO) replies.
- The virtual server must be running.

Server requirements

- Hyper-V server
A server on which Hyper-V is installed.
- Virtual server
A virtual server managed by Hyper-V.

Usage guidelines

- This service forcibly shuts down the OS of the specified virtual server. When this service is executed, data in files that are being edited on the virtual server will not be saved.
- If the network connectivity verification is enabled, depending on the system environment, the service might not be able to obtain all IP addresses immediately after the virtual server starts. For this reason, even if the virtual server is running, the task might end abnormally, because the osSendIcmp plug-in cannot verify network connectivity for all IPv4 addresses set on the virtual server. To ensure that all IP addresses are obtained, adjust the number of seconds specified for the hyperv.waitTime property, which determines the amount of time to wait after the virtual server starts before obtaining IP addresses.
- To perform the network connection verification, make sure that the total length of the IP addresses (IPv4) set for all NICs on a virtual server does not exceed 1,024 characters. If the total length exceeds 1,024 characters, an error might occur in the plug-in osSendIcmp, causing the task to end abnormally. The maximum length of one IP address (IPv4) including the comma used as an address separator is 16 characters.
- If you enable the network connectivity verification, adjust the value of the common.icmpEchoTimeout property based on your environmental needs.

Start virtual server: Service details

This service template starts multiple virtual servers in a Hyper-V environment.

The general steps for using this service template are as follows:

1. The status of a virtual server is obtained.
2. If the virtual server is stopped, it is started. If the virtual server is already running, the processing to start the virtual server is skipped. In all other cases, processing for that virtual server ends in an error.
3. If the network connection verification is enabled, the IP address (IPv4) set for the virtual server that was started is obtained. Then the local server sends an ICMP echo request to that server to verify whether it is connected to the network.

This processing is run in parallel for the specified virtual servers.

Before a virtual server is started, a verification of the virtual server status is performed for the number of times specified by the `hyperv.checkVmStateEnabledCount` property, at the interval specified (in seconds) by the `hyperv.checkVmStateEnabledInterval` property. Adjust the values of these properties based on your environmental needs.

Service Definition and Submit Service Properties

The following table lists the properties shown in the **Service Definition** window for the service template.

Property key	Property name	Description
<code>hyperv.targetHost</code> ^R	Hyper-V server host name	Specifies the host name or IP address of the Hyper-V server. IPv6 addresses are not supported.
<code>hyperv.waitTime</code> ^R	Wait time before starting to obtain IP address	When performing a network connectivity verification, specifies the amount of time, in seconds, after the virtual server starts to wait before starting to obtain the IP address.
<code>common.icmpEchoTimeout</code> ^R	Timeout period for ICMP echo requests	Specify in milliseconds how long the service waits for a reply to an ICMP echo request sent to confirm startup of a virtual server.

Property key	Property name	Description
hyperv.checkVmStateEnabledCount ^R	Virtual server status (startup complete) check count	Specifies the number of times to verify whether virtual server startup is complete. This value combined with the verification interval for the virtual server status (startup complete) determines the maximum wait time.
hyperv.checkVmStateEnabledInterval ^R	Virtual server status (startup complete) check interval	Specifies the interval in seconds between verifications for whether virtual server startup is complete.
<p>O: The property can be omitted. However, the property might be mandatory depending on what is specified for other properties. See the Description of each property.</p> <p>R: Required</p>		

The following table lists the properties shown in the **Service Definition** and the **Submit Service** windows:

Property key	Property name	Description
hyperv.foreachVmName ^R	Virtual server names (multiple names can be specified).	Specifies one or more names for the virtual server. (This is the name of the virtual server as it is displayed in Hyper-V. This is not the host name in the OS.) If specifying multiple names, separate them with commas. You can specify up to 99 names.
hyperv.checkNetworkConnection ^R	Check network connectivity.	Specifies whether to verify network connectivity after starting a virtual server.
<p>O: The property can be omitted. However, the property might be mandatory depending on what is specified for other properties. See the Description of each property.</p> <p>R: Required</p>		

Prerequisites

- The name of each virtual server on the Hyper-V server must be unique within a single Hyper-V server.
- The Data Exchange service of Hyper-V Integration Service on the target virtual server must be enabled.
- If the network connection verification is enabled, you must specify the address of the connection destination for agentless monitoring. Make sure to specify a loopback address that can be resolved from the name "localhost".
- If the network connection verification is enabled, the firewall for the target virtual server must permit ICMP (ECHO) replies.

Server requirements

- Hyper-V server
A server on which Hyper-V is installed.
- Virtual server
A virtual server managed by Hyper-V.

Usage guidelines

- When the network connection verification is performed, depending on the system environment, the task might not be able to obtain all IP addresses immediately after the virtual servers are started. As a result, even if all virtual servers are running, the osSendIcmp plug-in might not be able to confirm network connection for all IP addresses (IPv4) set on the virtual servers, and the task might end abnormally. To ensure that all IP addresses can be obtained, adjust the value (in seconds) of the hyperv.waitTime property, which specifies the amount of time to wait between starting a virtual server to obtaining an IP address.
- To perform the network connection verification, make sure that the total length of the IP addresses (IPv4) set for all NICs on a virtual server does not exceed 1,024 characters. If the total length exceeds 1,024 characters, an error might occur in the plug-in osSendIcmp, causing the task to end abnormally. The maximum length of one IP address (IPv4) including the comma used as an address separator is 16 characters.
- If you enable the network connection verification, adjust the value of the common.icmpEchoTimeout property based on your environmental needs.

Stop virtual server: Service details

This service template shuts down the OSs of multiple virtual servers in a Hyper-V environment.

The general steps for using this service template are as follows:

1. The service asks whether CPU and memory settings are to be changed. If you do not want to change either the CPU settings or the memory settings, the service ends abnormally.

2. If the virtual server is running, the OS of that virtual server is shut down. If the virtual server is stopped, the processing to shut down the OS is skipped. In all other cases, processing for that virtual server fails.

This processing is run in parallel for the specified virtual servers.

Service Definition and Submit Service Properties

The following table lists the properties shown in the **Service Definition** window for the service template.

Property key	Property name	Description
hyperv.targetHost ^R	Hyper-V server host name	Specifies the host name or IP address of the Hyper-V server. IPv6 addresses are not supported.
<p>O: The property can be omitted. However, the property might be mandatory depending on what is specified for other properties. See the Description of each property.</p> <p>R: Required</p>		

The following table lists the properties shown in the **Service Definition** and the **Submit Service** windows:

Property key	Property name	Description
hyperv.foreachVmName ^R	Virtual server names (multiple names can be specified).	Specifies one or more names for the virtual server. (This is the name of the virtual server as it is displayed in Hyper-V. This is not the host name in the OS.) If specifying multiple names, separate them with commas. You can specify up to 99 names.
<p>O: The property can be omitted. However, the property might be mandatory depending on what is specified for other properties. See the Description of each property.</p> <p>R: Required</p>		

Prerequisites

- The name of each virtual server on the Hyper-V server must be unique within a single Hyper-V server.
- The Shut down operating system service of Hyper-V Integration Service on the target virtual server must be enabled.

Server requirements

- Hyper-V server
A server on which Hyper-V is installed.
- Virtual server
A virtual server managed by Hyper-V.

Usage guidelines

If you run this service, the data of files that are currently being edited on the virtual server will not be saved.

Importing service templates

Before you can use service templates that are not imported by default, you must import them by using the Ops Center Automator UI.

Procedure

1. Access the Ops Center Automator UI.
 - If you are importing templates that are included with the product, you must log on to the Ops Center Automator server machine by using a remote connection.
 - If you are importing templates that you downloaded, you can access the UI from your local machine without using a remote connection.
2. Log on to Ops Center Automator with a user role of Develop or higher.
3. Use one of the following methods to import the service templates:
 - From the **Dashboard Guidance Menu**, go to the **Manage Service Templates** section, then click **Import Service Template**.
 - From the **Service Templates** tab Card View, click **Import**.



Note: If you plan to modify the template after you import it, you can also import the template from the Service Builder tool by accessing the Service Builder **Developing** tab, then clicking **Import**.

4. Browse to the location of the template files:
 - For templates provided with the product, go to one of the following locations and select a file with an .st or .zip extension:

In Windows-based OS, browse to `automation-software-installation-folder\public\contents`.

In Linux OS, browse to `automation-software-installation-directory/public/contents`.
 - For templates you downloaded, go to the location in which you saved the downloaded template zip file and select a file with a .zip extension.

Appendix D: Notices

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