

HP Operations Orchestration Software

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HP Storage Essentials version 6.0 Integration Guide

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3. In the **Product** list box, scroll down to and select **Operations Orchestration**.
4. In the **Product Version** list, click the version of the manuals that you're interested in.
5. In the **Operating System** list, click the relevant operating system.
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7. In the **Results** list, click the link for the file that you want.

Where to find Help, tutorials, and more

The HP Operations Orchestration software (HP OO) documentation set is made up of the following:

- Help for Central

Central Help provides information to the following:

- Finding and running flows
- For HP OO administrators, configuring the functioning of HP OO
- Generating and viewing the information available from the outcomes of flow runs

The Central Help system is also available as a PDF document in the HP OO home directory, in the \Central\docs subdirectory.

- Help for Studio

Studio Help instructs flow authors at varying levels of programming ability.

The Studio Help system is also available as a PDF document in the HP OO home directory, in the \Studio\docs subdirectory.

- Animated tutorials for Central and Studio

HP OO tutorials can each be completed in less than half an hour and provide basic instruction on the following:

- In Central, finding, running, and viewing information from flows
- In Studio, modifying flows

The tutorials are available in the Central and Studio subdirectories of the HP OO home directory.

- Self-documentation for operations and flows in the Accelerator Packs and ITIL folders
Self-documentation is available in the descriptions of the operations and steps that are included in the flows.

Support

For support information, including patches, troubleshooting aids, support contract management, product manuals and more, visit the following site: <http://www.hp.com/go/bsaessentialsnetwork>

This is the **BSA Essentials Network** Web page. To sign in:

1. Click **Login Now**.
2. On the **HP Passport sign-in** page, enter your HP Passport user ID and password and then click **Sign-in**.
3. If you do not already have an HP Passport account, do the following:
 - a. On the **HP Passport sign-in** page, click **New user registration**.
 - b. On the **HP Passport new user registration** page, enter the required information and then click **Continue**.
 - c. On the confirmation page that opens, check your information and then click **Register**.
 - d. On the **Terms of Service** page, read the Terms of use and legal restrictions, select the **Agree** button, and then click **Submit**.
4. On the **BSA Essentials Network** page, click **Operations Orchestration Community**.
The Operations Orchestration Community page contains links to announcements, discussions, downloads, documentation, help, and support.

Note: Contact your OO contact if you have any difficulties with this process.

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Acronyms

HP SM - HP Service Manager
HP SIM - HP Systems Insight Manager
HP OO - HP Operations Orchestration
HP MSA - HP Modular Smart array
HP EVA - HP Enterprise Virtual array
HP SE - HP Storage Essentials
CMS - Central Management Server
HBA - Host Bus Adapter
HSG - Host security group
SAN - Storage Area Network
ACL - Access Control List
ASM - Automatic Storage Management
HP uCMDB - HP Universal Configuration Management Database
LVM - Logical Volume Manager
VMFS - VM File System
CI - Configuration Item
REST - Representational State Transfer

Storage Automation Accelerator Pack flows

The **Storage Automation** accelerator pack contains a selection of preconfigured OO flows and operations—all based on Storage Essentials—that are available as part of the Storage Automation Toolkit.

In OO Studio, the Storage Automation flows are located in the **\Library\Accelerator Packs\Storage Automation** folder. The Storage Automation flows are organized in the following folders:

- Add or Remove HBA
- Deprecated
- Oracle Data Migration
- Provisioning
- Replace HBA
- Utility
- Zoning

Add or Remove HBA

Flow: Manage Volume ACL

This flow adds or removes the HBA port from the storage volume ACL in the given storage system. When adding an HBA port WWN to the storage volume's ACL, the flow creates the FC path from the HBA port to the storage volume by updating the underlying fabric/zone. When removing the HBA port, the underlying fabric is not affected.

This flow adds or removes the HBA port to or from the storage volume ACL by manipulating the corresponding HSG in the storage system. There are two kinds of HSGs: one is the multi-initiator HSG, which has more than one HBA port in it, and the other is the single-initiator HSG, which has only one HBA port in it.

The steps involved are:

1. Adding an HBA port to the storage volume ACL:
 - a. If the storage system already has the HBA port as part of an existing multi-initiator HSG, the flow will first remove the HBA port from this HSG and will create the new HSG with the HBA port and the given storage volume and move all the storage volumes in that existing HSG to the newly created one.
 - b. If the storage system already has the HBA port as part of an existing single-initiator HSG, the flow will add the HBA port to this HSG.
 - c. If the storage system doesn't have the HBA port as part of the existing HSG, the flow will create a new HSG with the given HBA port and the storage volume.
2. Removing the HBA port from the storage volume ACL:
 1. If the storage system already has the HBA port as part of existing multi-initiator HSG, the flow will first remove the HBA port from this HSG and will create the new HSG with the HBA port and all the storage volumes in that existing HSG except the given storage volume to the newly created one.
 2. If the storage system already has the HBA port as part of existing single-initiator HSG, the flow will remove the given storage volume from this HSG.

Ecosystem Applications

This flow uses the following application for doing the operations:

- *Storage Essentials* – This flow uses this application for adding or removing the HBA port from the storage volume ACL in the given storage system.

Inputs

- The Storage Essentials Central Management Server details, including:
 - The SE CMS name or IP address.
 - The username.
 - The password.

These are administrative inputs, so the OO admin user may want to statically configure them in Studio to hide them from non-admin users of the OO Central interface.

Notes:

- The Storage Essentials user should have adequate permissions to access the necessary resources (hosts, arrays, fabric) and perform the provisioning actions on them.
- If Storage Essentials CMS is integrated with HP SIM, the username in the flow execution should be given in the same case as the **Login Name** of the **Security > Users** tab in the Storage Essentials GUI.
- The HBA Port WWN to be added or removed.
- The name of the managed storage system on which this operation will be performed.
- The name of the storage volume, for which the HBA port will be added/removed from its ACL.
- The operation to be performed. This can be either **Add** or **Remove**. The selection list **SE–AddOrRemove** could be used for this input.
- The optional unit number to be used while adding the HBA port to a storage volume ACL. This unit number might not be used in some storage systems if it doesn't allow mapping the storage volume to the HBA port.

Results

- This flow returns the list of newly created zones while adding the HBA port to the storage volume ACL.

Responses

- *success* – On successful completion of this flow, the HBA port is added or removed properly from the storage volume ACL.
- *failure* – This flow returns this response when a failure occurred while adding or removing the HBA port from the storage volume ACL.

Flow: Add or Remove HBA from Volume ACL

This flow is the same as the **Manage Volume ACL** flow, but it also updates the uCMDB with the changes made using that flow.

The steps Involved are:

1. This flow collects all required inputs in the interactive mode and runs the flow **Manage Volume ACL** for adding or removing an HBA port from the storage volume ACL.
2. Once the above step is completed successfully, the flow refreshes the SE **Materialized** view and updates this view in the uCMDB. This is accomplished by using the flow **Refresh SE uCMDB**.

Ecosystem Applications

This flow uses the following applications for doing the operations:

- *Storage Essentials* – This flow uses this application for adding or removing the HBA port from the storage volume ACL in the given storage system.
- *HP uCMDB* – This flow uses this application for refreshing the CMDB with the changes introduced in the SAN using the Storage Essential application.

Inputs

- The Storage Essentials Central Management Server details, including:

- The SE CMS name or IP address.
- The username.
- The password.

These are administrative inputs, so the OO admin user may want to statically configure them in Studio to hide them from non-admin users of the OO Central interface.

Notes:

- The Storage Essentials user should have adequate permissions to access the necessary resources (hosts, arrays, fabric) and perform the provisioning actions on them.
- If Storage Essentials CMS is integrated with HP SIM, the username in the flow execution should be given in the same case as the **Login Name** of the **Security > Users** tab in the Storage Essentials GUI.
- The HBA Port WWN to be added or removed.
- The name of the managed storage system on which this operation will be performed.
- The name of the storage volume, for which the HBA port will be added or removed from its ACL.
- The operation to be performed. This can be either **Add** or **Remove**. The selection list **SE-AddOrRemove** could be used for this input.
- The optional unit number to be used while adding the HBA port to a storage volume ACL. This unit number might not be used in some storage systems if it doesn't allow mapping the storage volume to the HBA port.
- The uCMDB server details, including:
 - The uCMDB IP address.
 - The uCMDB user name. This user should have Administrator privileges.
 - The uCMDB password.
- Whether or not to refresh the SE **Materialized** view and uCMDB ("Yes" or "No").

Responses

- *success* – On successful completion of this flow, the HBA port is added or removed properly from the storage volume ACL and the SE **Materialized** view and uCMDB are updated successfully.
- *failure* – This flow returns this response when a failure occurred during the course of execution.

Flow: Add or Remove HBA from Volume ACL – Create Change Ticket

This flow creates the change ticket in HP Service Manager(SM) for updating the storage volume ACL by using the flow **Add or Remove HBA from Volume ACL**. Once the ticket is created, the user can use either of the following flows for updating the volume ACL:

- Add or Remove HBA from Volume ACL – Approve Change Ticket and Execute
- Add or Remove HBA from Volume ACL – Execute by using Change Ticket

The steps involved are:

- This flow collects all required inputs in the interactive mode and creates the change ticket for adding or removing the HBA port from the storage volume ACL.

Ecosystem Applications

This flow uses the following applications for doing the operations:

- *Storage Essentials* – This flow uses this application for adding or removing the HBA port from the storage volume ACL in the given storage system.
- *HP Service Manager(SM)* – This flow uses this application for creating the change ticket required by the above mentioned flows.

Inputs

- The Storage Essentials Central Management Server details, including:
 - The SE CMS name or IP address.
 - The username.
 - The password.

These are administrative inputs, so the OO admin user may want to statically configure them in Studio to hide them from non-admin users of the OO Central interface.

Notes:

- The Storage Essentials user should have adequate permissions to access the necessary resources (hosts, arrays, fabric) and perform the provisioning actions on them.
- If Storage Essentials CMS is integrated with HP SIM, the username in the flow execution should be given in the same case as the **Login Name** of the **Security > Users** tab in the Storage Essentials GUI.
- The HBA Port WWN to be added or removed.
- The name of the managed storage system on which this operation will be performed.
- The name of the storage volume for which the HBA port will be added or removed from its ACL.
- The operation to be performed. This can be either **Add** or **Remove**. The Selection List **SE-AddOrRemove** could be used for this input.
- The optional unit number to be used while adding the HBA port to a storage volume ACL. This unit number might not be used in some storage systems if it doesn't allow mapping the storage volume to the HBA port.
- The SM server details, including:
 - The IP address of SM.
 - The SM username. This user should have privileges for creating the ticket in SM.
 - The SM password.
 - The Protocol used for communicating with SM (http or https).
 - The SM's TCP Socket Port (Default values: 13080 for http / 13443 for https).
- The ticket details, including:
 - The contact for the ticket owner.
 - The coordinator for the ticket.
 - The owner of the ticket.
- The URL of the flow Add or Remove HBA from volume ACL – Execute by using Change Ticket.

Results

- On successful completion of this flow, the change ticket number is returned.

Responses

- *success* – On successful completion of this flow, the change ticket is created in the SM with the details collected during the course of the flow execution.

- *failure* – This flow returns this response when a failure occurred during the course of execution.

Flow: Add or Remove HBA from Volume ACL – Approve Change Ticket and Execute

This flow is used for approving the change ticket created by the flow **Add or Remove HBA from Volume ACL – Create Change Ticket** and for adding or removing the HBA port from the storage volume ACL.

The steps involved are:

1. Validate and approve the given change ticket, if it is not already approved.
2. If the given ticket is already approved, abort the flow with the warning response.
3. Add or remove the HBA port from the storage volume ACL by using the flow **Manage Volume ACL**.
4. Update the change ticket with the completion of the execution.

Ecosystem Applications

This flow uses the following applications for doing the operations:

- *Storage Essentials* – This flow uses this application for adding or removing the HBA port from the storage volume ACL in the given storage system.
- *HP Service Manager(SM)* – This flow uses this application for creating the Change Ticket required by the above mentioned flows.

Inputs

- The Storage Essentials Central Management Server details, including:
 - The SE CMS name or IP address.
 - The username.
 - The password.

These are administrative inputs, so the OO admin user may want to statically configure them in Studio to hide them from non-admin users of the OO Central interface.

Notes:

- The Storage Essentials user should have adequate permissions to access the necessary resources (hosts, arrays, fabric) and perform the provisioning actions on them.
- If Storage Essentials CMS is integrated with HP SIM, the username in the flow execution should be given in the same case as the **Login Name** of the **Security > Users** tab in the Storage Essentials GUI.
- The SM server details, including:
 - The IP address of SM.
 - The SM username. This user should have the privilege for creating the ticket in SM.
 - The SM password.
 - The protocol used for communicating with SM (http or https).
 - The SM's TCP Socket Port (Default values: 13080 for http / 13443 for https).
- The change ticket ID.
- The optional information such as the reason for approving the change ticket.

- Whether to approve the change ticket or not? (Yes/No).

Responses

- *success* – On successful completion of this flow, the change ticket is approved in the SM and the HBA port is added or removed from the storage volume ACL.
- *failure* – This flow returns this response when a failure occurred during the course of execution.
- *warningChange* – The ticket is already approved and it is assumed that changes are already executed.

Notes:

- This flow considers both the approval of the change ticket and the execution of change as atomic operation. So if the given change ticket is already approved, this flow doesn't execute the change and will abort with the warning response. In this case the user can use the flow **Add or Remove HBA port from Volume ACL – Execute by using Change Ticket**.
- This flow doesn't support with the change ticket which is directly created on SM.

Flow: Add or Remove HBA from Volume ACL – Execute using Change Ticket

This work-flow is same as the flow **Add or Remove HBA port from the Volume ACL – Approve Change Ticket and Execute** except that it won't approve the given Change Ticket and if the given Ticket is un-approved then it will fail with **failure** response.

Ecosystem Applications

This flow uses the following applications for doing the operations:

- *Storage Essentials* – This flow uses this application for adding or removing the HBA port from the storage volume ACL in the given storage system.
- *HP Service Manager(SM)* – This flow uses this application for creating the Change Ticket required by the above mentioned flows.

Inputs

- The Storage Essentials Central Management Server details, including:
 - The SE CMS name or IP address.
 - The username.
 - The password.

These are administrative inputs, so the OO admin user may want to statically configure them in Studio to hide them from non-admin users of the OO Central interface.

Notes:

- The Storage Essentials user should have adequate permissions to access the necessary resources (hosts, arrays, fabric) and perform the provisioning actions on them.
- If Storage Essentials CMS is integrated with HP SIM, the username in the flow execution should be given in the same case as the **Login Name** of the **Security > Users** tab in the Storage Essentials GUI.
- The SM server details, including:
 - The IP address of SM.

- The SM username. This user should have the privilege for creating the ticket in SM.
- The SM password.
- The protocol used for communicating with SM (http or https)
- The SM's TCP Socket Port (Default values: 13080 for http / 13443 for https)
- Change the ticket ID.

Responses

- *success* – On successful completion of this flow, the HBA port is added or removed from the storage volume ACL.
- *failure* – This flow returns this response when a failure occurred during the course of execution.

Note:

- This flow doesn't support a change ticket that is not created using the flow **Add or Remove HBA from Volume ACL – Create Change Ticket**.

Deprecated

Flow: Add or Remove HBA from Volume ACL

This flow adds or removes a host HBA port WWN on a storage volume ACL. The flow uses the underlying HP Storage Essentials infrastructure, which manages the SAN environment.

Inputs

- The Storage Essentials Central Management Server details, including:
 - The SE CMS name or IP address.
 - The username.
 - The password.

These are administrative inputs, so the OO admin user may want to statically configure them in Studio to hide them from non-admin users of the OO Central interface.

- The IP address or server name of the managed host (which has the HBA to be added or removed) in SE.
- The HBA port WWN to be added or removed.
- The name of the managed storage system in SE (which has the volume to be mapped or unmapped).
- The name of the storage volume in the storage system.
- The operation to be performed (**Add** or **Remove**).

Responses

- *success* – On successful completion of this flow, the input storage volume will be mapped or unmapped to the input host HBA.
- *failure* – The flow returns failure in case of error.

Flow: Create Change Ticket – Add or Remove HBA from Volume ACL

This flow logs a change ticket in HP Service Manager with all the inputs provided by the user requesting to add/remove a host HBA port WWN to/from storage volume ACL.

Inputs

- HP Service Manager server details:
 - The SM server name or IP address.
 - The protocol type (HTTPS/HTTP).
 - The TCP port (default ports for SM are 13443/13080).
 - The username.
 - The password.

These are administrative inputs, so the OO admin user may want to statically configure them in Studio to hide them from non-admin users of the OO Central interface.

Note:

- The HP Service Manager user should have adequate permissions to access the necessary resources to perform the actions.
- The Storage Essentials Central Management Server (CMS) details, including:
 - The SE CMS name or IP address.
 - The username.
 - The password.

These are administrative inputs, so the OO admin user may want to statically configure them in Studio to hide them from non-admin users of the OO Central interface.

Notes:

- The HP Storage Essentials user should have adequate permissions to access the necessary resources (hosts, arrays, fabric) and perform the provisioning actions on them.
- If Storage Essentials CMS is integrated with HP SIM, the username in the flow execution should be given in the same case as the **Login Name** of the **Security > Users** tab in the Storage Essentials GUI.
- The IP address or server name of the managed host (which has the HBA to be added or removed).
- The HBA port WWN to be added or removed.
- The name of the managed storage system (which has the volume to be mapped or unmapped).
- The name of the storage volume in the storage system.
- The operation to be performed (**Add** or **Remove**).

Responses

- *success* – On successful completion of this flow, the change ticket will be created.
- *failure* – The flow returns failure in case of error.

Flow: Add or Remove HBA from Volume ACL – using Change Ticket

This flow integrates the **Add or Remove HBA** operation with the change management functionality of HP Service Manager. This flow adds or removes a host HBA port WWN on storage volume ACL,

using the information provided in an approved change ticket of Service Manager, created by the **Create Change Ticket – Add or Remove HBA from volume ACL** flow.

The flow uses the underlying HP Storage Essentials infrastructure, which manages the SAN environment.

Inputs

- HP Service Manager server details:
 - The SM server name or IP address.
 - The username.
 - The password.
 - The protocol type (HTTPS/HTTP).
 - The TCP port (default ports for SM are 13443/13080).

These are administrative inputs, so the OO admin user may want to statically configure them in Studio to hide them from non-admin users of the OO Central interface.

Note:

- The HP Service Manager user should have adequate permissions to access the necessary resources to perform the actions.
- The change ticket ID (the ticket should be approved).
- The Storage Essentials Central Management Server (CMS) details, including:
 - The SE CMS name or IP address.
 - The username.
 - The password.

These are administrative inputs, so the OO admin user may want to statically configure them in Studio to hide them from non-admin users of the OO Central interface.

Notes:

- The HP Storage Essentials user should have adequate permissions to access the necessary resources (hosts, arrays, fabric) and perform the provisioning actions on them.
- If Storage Essentials CMS is integrated with HP SIM, the username in the flow execution should be given in the same case as the **Login Name** of the **Security > Users** tab in the Storage Essentials GUI.

Responses

- *success* – On successful completion of the flow, the input storage volume will be mapped or unmapped to the specified host HBA.
- *failure* – The flow returns failure in case of error.

Flow: Provision Storage for a server using Storage Essentials

This flow allows provisioning of storage volumes to hosts from storage arrays in a SAN environment. The provisioning operation is done using the underlying Storage Essentials infrastructure, which manages the SAN environment.

Inputs

- Storage Essentials Central Management Server (CMS) details, including:

- The SE CMS name or IP address.
- The username.
- The password.

These are administrative inputs, so the OO admin user may want to statically configure them in Studio to hide them from non-admin users of the OO Central interface.

Notes:

- The HP Storage Essentials user should have adequate permissions to access the necessary resources (hosts, arrays, fabric) and perform the provisioning actions on them.
- If Storage Essentials CMS is integrated with HP SIM, the username in the flow execution should be given in the same case as the **Login Name** of the **Security > Users** tab in the Storage Essentials GUI.
- The host for which storage needs to be provisioned.
- A name for the volume. This will be ignored by HP MSA, XP arrays, HDS, and EMC Symmetrix DMX, as the array will assign the volume name.
- The size of the volume.
- The desired redundancy level. The flow prompts the user to choose from one of the following three levels:
 - Non-redundant Striped Volumes (RAID0)
 - Redundant Parity Based Volumes (RAID5)
 - Redundant Mirrored Volumes (RAID1)

Based on the desired volume characteristics, the flow intelligently finds an array in the SAN which can provide the volume with the desired characteristics and then provisions the storage volume to the host.

Once the flow completes, the user needs to do a hardware refresh operation on the host (for example, rescan disks on Windows, ioscan on hp-ux) and then start using the storage volume.

In case the flow is not able to provision storage, it will try to undo all the changes it committed in the SAN environment as part of intermediate steps (for example, volume, zones, and HSG's created). This ensures that the flow tries to exit gracefully in case the provisioning operation is not successful (also known as flow rollback).

Responses

- *Success* – On successful completion of the flow, a new storage volume will be provisioned to the input host.
- *failure* – The flow returns failure in case of error.

Flow: Create Change Ticket – Provision Storage for a Server

This flow creates a change ticket in HP Service Manager with all the inputs provided by the user requesting to provision storage volumes to hosts.

Inputs

- Storage Essentials Central Management Server (CMS) details, including:
 - The SE CMS name or IP address.
 - The username.
 - The password.

These are administrative inputs, so the OO admin user may want to statically configure them in Studio to hide them from non-admin users of the OO Central interface.

Notes:

- The HP Storage Essentials user should have adequate permissions to access the necessary resources (hosts, arrays, fabric) and perform the provisioning actions on them.
- If Storage Essentials CMS is integrated with HP SIM, the username in the flow execution should be given in the same case as the **Login Name** of the **Security > Users** tab in the Storage Essentials GUI.
- The host name or IP address for which storage needs to be provisioned.
- A name for the volume. This will be ignored by HP MSA, XP arrays, HDS, and EMC Symmetrix DMX, as the array will assign the volume name.
- The size of the volume.
- The desired redundancy level. The flow prompts the user to choose from one of the following three levels:
 - Non-redundant Striped Volumes (RAID0)
 - Redundant Parity Based Volumes (RAID5)
 - Redundant Mirrored Volumes (RAID1)
- For creation of the ticket, the user needs to provide the Service Manager server information including:
 - The SM server name or IP address.
 - The username.
 - The password.

The above are administrative inputs, so the OO admin user may want to statically configure them in Studio to hide them from non-admin users of the OO Central interface.

- The protocol type (HTTPS/HTTP).
- The TCP Port (default ports for SM are 13443/13080).
- The contact.
- The coordinator.
- Requested By.

Responses

- *success* – On successful completion of the flow, a new change ticket is created.
- *failure* – The flow returns failure in case of error.

Flow: Provision Storage for a server using Storage Essentials –using Change Ticket

This flow integrates provisioning operation with Change Management functionality of HP Service Manager. This flow provisions storage volumes to hosts from storage arrays in a SAN environment using the information provided in the approved change ticket of Service Manager, created by the above flow (**Create Change Ticket – Provision Storage for a Server**). The provisioning operation is done using the underlying Storage Essentials infrastructure, which manages the SAN environment.

Inputs

- The SM server details:
 - The SM server name or IP address.
 - The username.
 - The password.

The above are administrative inputs, so the OO admin user may want to statically configure them in Studio to hide them from non-admin users of the OO Central interface.

- The protocol type (HTTPS/HTTP).
- The TCP Port (default ports for SM are 13443/13080).
- The contact.
- The coordinator.
- Requested By.
- The change ticket ID (the ticket should be approved).
- The Storage Essentials Central Management Server (CMS) details, including:
 - The username.
 - The password.

These are administrative inputs, so the OO admin user may want to statically configure them in Studio to hide them from non-admin users of the OO Central interface.

Notes:

- The Storage Essentials user should have adequate permissions to access the necessary resources (hosts, arrays, fabric) and perform the provisioning actions on them.
- If Storage Essentials CMS is integrated with HP SIM, the username in the flow execution should be given in the same case as the **Login Name** of the **Security > Users** tab in the Storage Essentials GUI.

Based on the desired volume characteristics obtained from the change ticket, the flow intelligently finds an array in the SAN which can provide the volume with the desired characteristics and then provisions the requested storage to the host.

In case the flow is not able to provision storage, it will try to undo all the changes it committed in the SAN environment as part of intermediate steps (for example, volume, zones, and HSG's created). This ensures that the flow tries to exit gracefully in case the provisioning operation is not successful.

Once the flow completes successfully, the user needs to do a hardware refresh operation on the host (for example, rescan disks on Windows, ioscan on hp-ux) and then start using the storage. Also, the change ticket will be updated and closed

Responses

- *success* – On successful completion of the flow, a new storage volume will be provisioned to the input host.
- *failure* – The flow returns failure in case of error.

Oracle Data Migration

Flow: Check if Zone Creation Required

This flow checks if zone creation is required between the host and the storage system, using the underlying Storage Essentials infrastructure.

Ecosystem Applications

This flow uses the following application:

- *HP Storage Essentials* – This flow uses this application for checking if zone creation is required between the host and the storage system.

Inputs

- The Storage Essentials Central Management Server details, including:
 - The SE CMS name or IP address.
 - The username.
 - The password.

These are administrative inputs, so the OO admin user may want to statically configure them in Studio to hide them from non-admin users of the OO Central interface.

Note:

- The HP Storage Essentials user should have adequate permissions to access the necessary resources (hosts, arrays, fabric) and perform the provisioning actions on them.
- If HP Storage Essentials CMS is integrated with HP SIM, the domain\username in the flow execution should be specified in the *same case* as the logged-on user information displayed in the SE GUI, as highlighted below.
- The name of the storage system to check for zone creation.
- The name of the host to check for zone creation.

Responses

- *yes* – Zone creation is required.
- *no* – Zone creation is not required.

Flow: Create Logical Volume for the given Storage Volume List on Windows Host

This flow creates a logical volume for the given storage volumes list on the Windows host.

Ecosystem Applications

This flow uses the following application:

- *HP Storage Essentials* – This flow uses this application for getting the storage volume path to the Windows host.

Inputs

- Windows host details, including:
 - The host name as discovered on Storage Essentials.
 - The host IP Address.
 - The username.
 - The password.

These are administrative inputs, so the OO admin user may want to statically configure them in Studio to hide them from non-admin users of the OO Central interface.

- The Storage Essentials Central Management Server details, including:
 - The SE CMS name or IP address.
 - The username.
 - The password.

These are administrative inputs, so the OO admin user may want to statically configure them in Studio to hide them from non-admin users of the OO Central interface.

Notes:

- The HP Storage Essentials user should have adequate permissions to access the necessary resources (hosts, arrays, fabric) and perform the provisioning actions on them.
- If HP Storage Essentials CMS is integrated with HP SIM, the domain\username in the flow execution should be specified in the *same case* as the logged-on user information displayed in the SE GUI, as highlighted below.
- The list of storage volumes for which a logical volume has to be created on the Windows host.
- The name of the storage system on which the volumes exist.

Results

- A list of storage volumes mapped with the logical drive number on the host.

Responses

- *success* – On successful completion of the flow, the logical volumes will be created on the Windows host for the input volume list.
- *failure* – The flow returns failure if iterating through the volume list fails.

Flow: Drop Oracle Disk from Disk Group

This flow drops the given Oracle ASM disk from the input Oracle ASM disk group.

Ecosystem Applications

This flow uses the following application:

- *Oracle 10gR2* – This flow uses this application for managing the ASM disks.

Inputs

- Window host details, including:
 - The host IP address.
 - The username.
 - The password.

These are administrative inputs, so the OO admin user may want to statically configure them in Studio to hide them from non-admin users of the OO Central interface.

- The Storage Essentials Central Management Server details, including:
 - The SE CMS name or IP address.
 - The username.
 - The password.

These are administrative inputs, so the OO admin user may want to statically configure them in Studio to hide them from non-admin users of the OO Central interface.

Notes:

- The HP Storage Essentials user should have adequate permissions to access the necessary resources (hosts, arrays, fabric) and perform the provisioning actions on them.
- If HP Storage Essentials CMS is integrated with HP SIM, the domain\username in the flow execution should be specified in the *same case* as the logged-on user information displayed in the SE GUI, as highlighted below.
- The Oracle ASM instance password for user "sys".
- The Oracle ASM disk group name from which the ASM disk has to be dropped.
- The Oracle ASM disk to be dropped from the Oracle ASM disk group.

Responses

- *success* – On successful completion of the flow, the input Oracle ASM disk will be dropped from the input Oracle ASM disk group.
- *failure* – The flow returns failure if the Oracle ASM Disk drop fails.

Flow: Find Old LUN Details from Host

This flow get the storage volume details as mapped on the Windows host.

Ecosystem Applications

This flow uses the following applications:

- HP Storage *Essentials* – This flow uses this application for getting the Windows host details.
- Oracle *10gR2* – This flow uses this application to get the ASM stamped disks.

Inputs

- The Window host details, including:
 - The host name as discovered on HP Storage Essentials.
 - The username.

- The password.

These are administrative inputs, so the OO admin user may want to statically configure them in Studio to hide them from non-admin users of the OO Central interface.

- The Storage Essentials Central Management Server details, including:
 - The SE CMS name or IP address.
 - The username.
 - The password.

These are administrative inputs, so the OO admin user may want to statically configure them in Studio to hide them from non-admin users of the OO Central interface.

Notes:

- The HP Storage Essentials user should have adequate permissions to access the necessary resources (hosts, arrays, fabric) and perform the provisioning actions on them.
- If HP Storage Essentials CMS is integrated with HP SIM, the domain\username in the flow execution should be specified in the *same case* as the logged-on user information displayed in the SE GUI, as highlighted below.
- The **PathsWithVolume** output from the **Get All Paths** Storage Automation Toolkit operation.

Results

- A list of LUN details on host in the format:
[OldVolName1,lunNo1,OraclePath1,OracleDiskSize1|OldVolName2,lunNo2,OraclePath2,OracleDiskSize2|.....]

Responses

- *success* – On successful completion of the flow, the Oracle ASM disk will be retrieved from the Windows host.
- *failure* – The flow returns failure when it fails to retrieve the Oracle ASM disk details from the Windows host.

Flow: Find Old LUN Details from Oracle ASM

This flow gets the LUN details mapped to Oracle ASM on the Windows host.

Ecosystem Applications

This flow uses the following application:

- *Oracle 10gR2* – This flow uses this application to get the ASM stamped disks.

Inputs

- The Window host details, including:
 - The host IP address.
 - The username.
 - The password.

These are administrative inputs, so the OO admin user may want to statically configure them in Studio to hide them from non-admin users of the OO Central interface.

- The Oracle ASM instance password for user "sys".
- A list of LUN details on host of the format:
[OldVolName1,lunNo1,OraclePath1,OracleDiskSize1|OldVolName2,lunNo2,OraclePath2,OracleDiskSize2|.....]

Results

- A list of LUN details on host of the format:
[StorageVolumeName1,lunNo1,OraclePath1,OracleDiskSize1,diskGroup1,OracleDiskName1|StorageVolumeName2,lunNo2,OraclePath2,OracleDiskSize2,diskGroup2,OracleDiskName2|.....]

Responses

- *success* – On successful completion of the flow, LUN details mapped to the Oracle ASM on the Windows host will be retrieved.
- *failure* – The flow returns failure when it fails to retrieve the LUN details mapped to the Oracle ASM on the Windows host.

Flow: Find Old LUN Details from SE

This flow retrieves the Windows host paths for the input storage system with storage volumes.

Ecosystem Applications

This flow uses the following application:

- *HP Storage Essentials* – This flow uses this application for getting the Windows host paths for the input storage system with storage volumes.

Inputs

- The Storage Essentials Central Management Server details, including:
 - The SE CMS name or IP address.
 - The username.
 - The password.

These are administrative inputs, so the OO admin user may want to statically configure them in Studio to hide them from non-admin users of the OO Central interface.

Notes:

- The HP Storage Essentials user should have adequate permissions to access the necessary resources (hosts, arrays, fabric) and perform the provisioning actions on them.
- If HP Storage Essentials CMS is integrated with HP SIM, the domain\username in the flow execution should be specified in the *same case* as the logged-on user information displayed in the SE GUI, as highlighted below.
- The Window host name as discovered on SE.
- The name of the storage system on which the Oracle ASM LUNs exist.

Results

- **PathsWithVolume** output from the **Get All Paths** Storage Automation Toolkit operation.

Responses

- *success* – On successful completion of the flow, the Windows host paths for the input storage system with storage volumes will be retrieved.
- *failure* – The flow returns failure when it fails to retrieve the Windows host paths for the input storage system.

Flow: Get Oracle ASM Disk Details

This flow gets details of LUNs mapped to Oracle ASM databases on the Windows host.

Ecosystem Applications

This flow uses the following applications:

- *HP Storage Essentials* – This flow uses this application for getting the Windows host details.
- *Oracle 10gR2* – This flow uses this application to get disks mapped to Oracle ASM databases on the Windows host.

Inputs

- The Window host details, including:
 - The host name as discovered by SE.
 - The username.
 - The password.

These are administrative inputs, so the OO admin user may want to statically configure them in Studio to hide them from non-admin users of the OO Central interface.

- The Storage Essentials Central Management Server details, including:
 - The SE CMS name or IP address.
 - The username.
 - The password.

These are administrative inputs, so the OO admin user may want to statically configure them in Studio to hide them from non-admin users of the OO Central interface.

Notes:

- The HP Storage Essentials user should have adequate permissions to access the necessary resources (hosts, arrays, fabric) and perform the provisioning actions on them.
- If HP Storage Essentials CMS is integrated with HP SIM, the domain\username in the flow execution should be specified in the *same case* as the logged-on user information displayed in the SE GUI, as highlighted below.
- The Oracle ASM instance password for user "sys".
- The storage system name that has to be replaced.

Results

- A list of LUN details mapped to the Oracle ASM on host in the format:
[StorageVolumeName1,lunNo1,OraclePath1,OracleDiskSize1,diskGroup1,
OracleDiskName1|StorageVolumeName2,lunNo2,OraclePath2,OracleDiskSize2,diskGroup2,Oracle
DiskName2|.....]

Responses

- *success* – On successful completion of the flow, details of LUNs mapped to Oracle ASM databases on the Windows host are retrieved.
- *failure* – The flow returns failure when it fails to retrieve details of LUNs mapped to Oracle ASM databases on the Windows host.

Flow: Windows Oracle Provisioning – Expand given Oracle Disk Group

This flow adds the given Oracle ASM disk to the input Oracle ASM disk group.

Ecosystem Applications

This flow uses the following application:

- *Oracle 10gR2* – This flow uses this application for managing the ASM disks.

Inputs

- Window host details, including:
 - The host IP address.
 - The username.
 - The password.

These are administrative inputs, so the OO admin user may want to statically configure them in Studio to hide them from non-admin users of the OO Central interface.

- The Storage Essentials Central Management Server details, including:
 - The SE CMS name or IP address.
 - The username.
 - The password.

These are administrative inputs, so the OO admin user may want to statically configure them in Studio to hide them from non-admin users of the OO Central interface.

Notes:

- The HP Storage Essentials user should have adequate permissions to access the necessary resources (hosts, arrays, fabric) and perform the provisioning actions on them.
- If HP Storage Essentials CMS is integrated with HP SIM, the domain\username in the flow execution should be specified in the *same case* as the logged-on user information displayed in the SE GUI, as highlighted below.
- The Oracle ASM instance password for user "sys".
- The Oracle ASM disk group name to which the ASM disk has to be added.
- The Oracle ASM disk to be added to the Oracle ASM disk group.

Responses

- *success* – On successful completion of the flow, the input Oracle ASM disk will be added to the input Oracle ASM disk group.
- *failure* – The flow returns failure if Oracle ASM disk expand fails.

Flow: Oracle Data Migration

This flow replaces a storage system serving the Oracle ASM in a fabric with another storage system. The following are the steps followed to achieve Oracle data migration:

1. The flow finds out all the LUNs that the Oracle ASM uses in the array that need to be replaced and gets their total capacity.
2. The flow provisions an equivalent amount of disk space to the OS on which Oracle ASM is running from the new storage system.
3. The flow adds the created storage to Oracle ASM.
4. The flow drops the storage used by Oracle ASM from the old storage system and declares that the Oracle ASM is no longer dependent on the old array.

Ecosystem Applications

This flow uses the following applications:

- *HP Storage Essentials* – This flow uses this application for getting the Windows host details and to provision new storage to the Windows host.
- *Oracle 10gR2* – This flow uses this application to add newly provisioned storage and drop disks from the storage system that have to be replaced.

Responses

- *success* – On successful completion of the flow, Oracle ASM disks from the old storage system will be migrated to the new storage system.
- *failure* – The flow returns failure if it fails to migrate Oracle ASM disks to the new storage system.

Notes:

- This flow does not support headless/REST execution.
- The ORACLE_HOME environment variable should be set to "<Oracle Installed Location>\BIN".

Provisioning

Flow: End-to-End Host Storage Provisioning

This flow allows the provisioning of storage volumes to an HPUX/Windows host from storage arrays in a SAN environment and the creation of logical volumes on the host from these storage volumes.

This flow uses the following subflows:

- Provisioning Storage to the Selected host

This subflow allows provisioning of storage volumes to hosts from storage arrays in a SAN environment.

- Create Logical Volume on HP–UX host/Create Logical Volume on Windows host
Based on the operating system of the host, either:
 - Create Logical Volume on HP–UX host
This flow creates a logical volume on the HPUX host from a storage volume provisioned to the host from any storage array in SAN.
 - Create Logical Volume on Windows host
This flow creates the logical volume on the disk drive which is assigned from the storage system.

Inputs

- Storage Essentials Central Management Server (CMS) details, including:
 - The SE CMS name or IP address.
 - The username.
 - The password.

These are administrative inputs, so the OO admin user may want to statically configure them in Studio to hide them from non–admin users of the OO Central interface.

Note:

- The HP Storage Essentials user should have adequate permissions to access the necessary resources (hosts, arrays, fabric) and perform the provisioning actions on them.
- If HP Storage Essentials CMS is integrated with HP SIM, then the username in the flow execution should be given in the same case as “Login Name” of Security –> Users Tab in the HP Storage Essentials GUI.
- The name or IP address of the host for which storage needs to be provisioned.
- A name for the storage volume – this will be ignored by HP MSA, XP arrays, HDS, and EMC Symmetrix DMX, as the array will assign the volume name.
- The size of the volume.
- Desired redundancy level. The flow prompts the user to choose from one of the following three levels:
 - Non–redundant Striped Volumes (RAID0)
 - Redundant Parity Based Volumes (RAID5)
 - Redundant Mirrored Volumes (RAID1)
- The host credentials:
 - The host username.
 - The host password.

Responses

- *success* – On successful completion of this flow, a new storage volume will be provisioned to the selected host and a new storage LUN will be created on the host.
- *failure* – This flow returns failure if either provision of storage volume to host or creation of storage LUN on the host fails.

Flow: End-to-End Oracle Storage Provisioning

This flow allows the provisioning of storage volumes to an HPUX/Windows host from storage arrays in a SAN environment and the creation of storage LUN on the host for adding to the Oracle ASM disk group.

This flow uses the following subflows:

- Provisioning Storage to the Selected host
This subflow allows provisioning of storage volumes to hosts from storage arrays in a SAN environment.
- Create Logical Volume on HP-UX host for Oracle/Create Logical Volume on Windows host for Oracle
 - Create Logical Volume on HP-UX host for Oracle
This flow creates either a raw disk or a logical volume on the HPUX host from a storage volume provisioned to the host from any storage array in SAN. The decision to create raw disk or logical volume will be based on the user input—whether the user wants to add a raw disk or raw volume to the ASM Disk Group.
 - Create Logical Volume on Windows host for Oracle
This flow creates the logical volume on the disk drive which is assigned from the storage system for an Oracle application.
- HPUX Oracle Provisioning – Expand Oracle Disk Group/Windows Oracle Provisioning – Expand Oracle Disk Group
 - HPUX Oracle Provisioning – Expand Oracle Disk Group
This flow takes an already provisioned raw disk or raw volume on the host as an input and adds it to the ASM disk group.
 - Windows Oracle Provisioning – Expand Oracle Disk Group
This flow prepares the specified disk drive on a Windows host for Oracle ASM Disk Group and adds it to the Disk Group.

Inputs

- Storage Essentials Central Management Server (CMS) details, including:
 - The SE CMS name or IP address.These are administrative inputs, so the OO admin user may want to statically configure them in Studio to hide them from non-admin users of the OO Central interface.

Note:

- The HP Storage Essentials user should have adequate permissions to access the necessary resources (hosts, arrays, fabric) and perform the provisioning actions on them.
- If HP Storage Essentials CMS is integrated with HP SIM then the username in the flow execution should be given in the same case as “Login Name” of Security -> Users Tab in the HP Storage Essentials GUI.
- The name or IP address of the host for which storage needs to be provisioned.
- A name for the storage volume. This will be ignored by HP MSA, XP arrays, HDS and EMC Symmetrix DMX, as the array will assign the volume name.
- The size of the volume.
- The desired redundancy level. The flow prompts the user to choose from one of the following three levels:

- Non–redundant Striped Volumes (RAID0)
- Redundant Parity Based Volumes (RAID5)
- Redundant Mirrored Volumes (RAID1)
- The Oracle database name.

Responses

- *success* – On successful completion of this flow, a new storage volume will be provisioned to the selected host and a new storage LUN will be created and added to the ASM disk group.
- *failure* – This flow returns failure if provision of the storage volume to the host or the creation of the storage LUN on the host or ASM disk group alteration fails.

Note:

- The ORACLE_HOME environment variable should be set to "<Oracle Installed Location>\BIN".

System Account Reference

Update the inputs of step **System Credentials**, in the **End–to–End Oracle Storage Provisioning** flow with the system accounts listed here.

Input Name	System Account Name	Description
seUsername	SE	Storage Essentials login credential
sePassword	SE	Storage Essentials login credential
windowsServerUsername	WindowsServer	Windows Server login credential
windowsServerPassword	WindowsServer	Windows Server login credential
windowsOracleUsername	OracleWindows	Oracle Application login credential on windows system
windowsOraclePassword	OracleWindows	Oracle Application login credential on windows system
hpuxServerUsername	HpuxServer	HP–UX Server login credential
hpuxServerPassword	HpuxServer	HP–UX Server login credential
hpuxOracleUsername	OracleHpux	Oracle Application login credential on HP–UX system
hpuxOraclePassword	OracleHpux	Oracle Application login credential on HP–UX system

Note: These changes need to be done for every upgrade of Operations Orchestration or whenever this flow is imported to Studio.

Provisioning–Windows

Prerequisite: Enabling Telnet on the host that is used for provisioning.

Flow: ASM Tool Stamping on Windows Disk Drive

This flow makes a Telnet session and stamps the disk drive specified using the Oracle ASM tool utility.

Inputs

- The Windows host IP address on which the flow executes the disk stamping.
- The host credentials:
 - The host username.
 - The host password.
- The Telnet port (the default is 23) and the Telnet session (the default is ICT_Session1) to be connected.
- The disk drive number to be stamped using the ORACLE ASM tool utility. to add the disk drive to the ORACLE Disk Group.

Responses

- *success* – On successful completion of the flow, the disk drive specified is stamped as an Oracle disk
- *failure* – The flow returns failure for one of these cases if the disk stamping fails on the specified host.

Flow: Create Extended Logical Drive on Host

This flow creates a logical drive of the specified size on the specified host. The steps involved are:

1. Get all the free disk drives on the host specified.
2. Iterate through each disk drive size to check if the requested size matches any of the disks, and then select a disk that does.
3. Create an extended logical partition on the selected disk.

Inputs

- The Windows host IP address on which the flow creates a new volume.
- The host credentials:
 - The host username.
 - The host password.
- The size of the volume to be created.

Responses

- *success* – On successful completion of the flow, a new logical volume will be created on the selected Windows host.
- *failure* – The flow returns failure for one of these cases if the extended logical partition creation fails on the selected Windows host

Flow: Create Logical Volume on Windows Host

This flow creates a logical volume on the Windows host from a storage volume provisioned to the host from any storage array in SAN. The steps involved are:

1. Rescan the disk on the Windows host to see the newly provisioned storage volume.
2. Refresh SE CMS to have the latest Windows host changes.
3. Get the paths for the storage volume specified on the storage array.
4. Get a host disk drive number for one of the paths of the storage volume.
5. Create a primary partition on this disk; assign a drive letter for this partition/volume.
6. Format the volume created.

Ecosystem Applications

This flow uses the following applications:

- *Storage Essentials* – This flow uses SE to refresh the host to see the newly provisioned storage volume and to get the path to this newly created raw disk.

Inputs

- The Storage Essentials Central Management Server details, including:
 - The SE CMS name or IP address.
 - The username.
 - The password.

These are administrative inputs, so the OO admin user may want to statically configure them in Studio to hide them from non-admin users of the OO Central interface.

Notes:

- The Storage Essentials user should have adequate permissions to access the necessary resources (hosts, arrays, fabric) and perform the provisioning actions on them.
- If Storage Essentials CMS is integrated with HP SIM, the **username** in the flow execution should be given in the same case as the **Login Name** on the **Security > Users** tab in the Storage Essentials GUI.
- The Windows host name on which the flow creates a new volume.
- The host credentials:
 - The host username.
 - The host password.
- The name of the storage volume which got provisioned to the host.
- The name of the storage array from which the storage volume got provisioned to the host.

Responses

- *success* – On successful completion of the flow, a new logical volume will be created on the selected Windows host.
- *failure* – The flow returns failure for one of these cases:
 - If the logical volume creation fails on the selected Windows host.
 - If Rescan Disk on the Windows host fails.
 - If the specified storage volume is not found.

Flow: Create Logical Volume on Windows Host for Oracle

This flow creates an extended logical partition on the Windows host from a storage volume provisioned to the host from a storage array in SAN. The steps involved are:

1. Rescan Disk on the Windows host to see the newly provisioned storage volume.
2. Refresh SE CMS to have the latest Windows host changes.
3. Get all the paths for the storage volume specified on the storage array.
4. Get a host disk drive number for one of the paths of the storage volume.
5. Create an extended logical partition on this disk.

Ecosystem Applications

This flow uses the following application:

- *Storage Essentials* – This flow uses SE to refresh the host to see the newly provisioned storage volume and to get the path to this newly created raw disk.

Inputs

- The Storage Essentials Central Management Server details, including:
 - The SE CMS name or IP address.
 - The username.
 - The password.

These are administrative inputs, so the OO admin user may want to statically configure them in Studio to hide them from non-admin users of the OO Central interface.

Notes:

- The Storage Essentials user should have adequate permissions to access the necessary resources (hosts, arrays, fabric) and perform the provisioning actions on them.
- If Storage Essentials CMS is integrated with HP SIM, the **username** in the flow execution should be given in the same case as the **Login Name** on the **Security > Users** tab in the Storage Essentials GUI.
- The Windows host name on which the flow creates a new logical partition.
- The host credentials:
 - The host username.
 - The host password.
- The name of the storage volume which got provisioned to the host.
- The name of the storage array from which the storage volume got provisioned to the host.

Responses

- *success* – On successful completion of the flow, a new logical volume will be created on the selected Windows host.
- *failure* – The flow returns failure for one of these cases:
 - If the logical volume creation fails on the selected Windows host.
 - If Rescan Disk on the Windows host fails.
 - If the specified storage volume is not found.

Results

- *Host Name* – The name of the host for which the raw disk or volume was created.
- *Logical Volume* – The name of the new raw disk or volume created.

Flow: Windows Oracle Provisioning – Expand Oracle Disk Group

This flow takes an already provisioned logical disk partition as an input, stamps it as an ORACLE disk and adds it to the ORACLE ASM disk group. The steps involved are:

1. Disk Stamp the specified disk partition using the Oracle ASM Tool.
2. Get the first disk group name of the specified database.
3. Alter this disk group by adding the stamped disk.

Ecosystem Applications

This flow uses the following application for doing the operations:

- *Storage Essentials* – This flow uses SE to get the host details such as host name and IP address.

Inputs

- The Windows host IP address.
- The host credentials:
 - The host username.
 - The host password.

Host credentials are retrieved from the system account **WindowsServer** which is present in the OO Studio system accounts. The OO admin has to save the host credentials in this system account before executing this flow.

- The disk drive number to be stamped and added to the ASM disk group.
- The Oracle database name:
 - The database credentials.
 - The database username.
 - The database password.

DB credentials are retrieved from the system account **OracleWindows** which is present in the OO Studio system accounts. The OO admin has to save the DB credentials in this system account before executing this flow.

Responses

- *success* – On successful completion of the flow, the new logical volume will be added to the oracle ASM disk group.
- *failure* – The flow returns failure if the disk group alteration to add the new logical volume fails.

Provisioning–HP–UX

Flow: Create Logical Volume on HP–UX Host

This flow creates a logical volume on the HP-UX host from a storage volume provisioned to the host from any storage array in SAN. The steps involved are:

1. Refresh the HP-UX host to see the newly provisioned storage volume.
2. Create a direct access storage device (a raw disk device) for use as a physical volume in a volume group.
3. Create a block device special file.
4. Create a new LVM volume group.
5. Create the logical volume in the newly created LVM volume group.

Ecosystem Applications

This flow uses the following applications:

- *Storage Essentials* – This flow uses SE to refresh the host to see the newly provisioned storage volume and to get the path to this newly created raw disk.

Inputs

- The Storage Essentials Central Management Server details, including:
 - The SE CMS name or IP address.
 - The username.
 - The password.

These are administrative inputs, so the OO admin user may want to statically configure them in Studio to hide them from non-admin users of the OO Central interface.

Note:

- The Storage Essentials user should have adequate permissions to access the necessary resources (hosts, arrays, fabric) and perform the provisioning actions on them.
- If Storage Essentials CMS is integrated with HP SIM, the **username** in the flow execution should be given in the same case as the **Login Name** on the **Security > Users** tab in the Storage Essentials GUI.
- The HP-UX host name on which the flow creates a new LV.
- The host credentials:
 - The host username.
 - The host password.
- The name of the storage volume which got provisioned to the host.

- The name of the storage array from which the storage volume got provisioned to the host.

Responses

- *success* – On successful completion of the flow, a new logical volume will be created on the selected HP–UX host.
- *failure* – The flow returns failure if the logical volume creation fails on the selected HP–UX host.

Flow: Create Logical Volume on HP–UX Host for Oracle

This flow creates either a raw disk or a logical volume on the HPUX host from a storage volume provisioned to the host from any storage array in SAN. The decision to create raw disk or a logical volume is based on whether the user wants to add a raw disk or raw volume to the ASM Disk Group. The steps involved are:

1. Refresh the HPUX host to see the newly provisioned storage volume.
2. Get the user input to decide whether to add a raw disk or raw volume to the ASM disk group.
3. If the user selects the raw disk option, the flow returns the newly provisioned raw disk.
4. If the user selects the raw volume option:
 1. Create a direct access storage device (a raw disk device) for use as a physical volume in a volume group.
 - d. Create a block device special file.
 - e. Create a new LVM volume group.
 - f. Create a logical volume in the newly–created LVM volume group.
 - g. Return this logical volume to add to the ASM disk group.

Ecosystem Applications

This flow uses the following application:

- *Storage Essentials* – This flow uses SE to refresh the host to see the newly provisioned storage volume and to get the path to the newly created raw disk.

Inputs

- The Storage Essentials Central Management Server details, including:
 - The SE CMS name or IP address.
 - The username.
 - The password.

These are administrative inputs, so the OO admin user may want to statically configure them in Studio to hide them from non–admin users of the OO Central interface.

Notes:

- The Storage Essentials user should have adequate permissions to access the necessary resources (hosts, arrays, fabric) and perform the provisioning actions on them.
- If Storage Essentials CMS is integrated with HP SIM, the **username** in the flow execution should be given in the same case as the **Login Name** on the **Security > Users** tab in the Storage Essentials GUI.
- The HPUX host name on which the flow creates a new LV.

- The host credentials:
 - The host username.
 - The host password.
- The name of the storage volume which was provisioned to the host.
- The name of the storage array from which the storage volume was provisioned to the host.

Responses

- *success* – On successful completion of the flow, either a raw disk or a raw volume will be created on the selected HP–UX host based on the user selection.
- *failure* – The flow returns failure if the logical volume creation fails on the selected HP–UX host.

Results

- *Host Name* – The name of the host for which the raw disk or volume was created.
- *Logical Volume* – The name of the new raw disk or volume created.

Note:

The flow supports both raw volume and raw disk creations.

Flow: HPUX Oracle Provisioning – Expand Oracle Disk Group

This flow takes an already provisioned raw disk or raw volume on the host as an input and adds it to the ASM disk group. The steps involved are:

1. Select the first available disk group from the oracle ASM disk group.
2. Alter the disk group to add the newly created raw disk or raw volume.

Ecosystem Applications

This flow uses the following application for doing the operations:

- *Storage Essentials* – This flow uses SE to get the host details such as host name and IP address.

Inputs

- The Storage Essentials Central Management Server details, including:
 - The SE CMS name or IP address.
 - The username.
 - The password.

Storage Essentials credentials are retrieved from the system account **SE** which is present in the OO Studio system accounts. The OO admin has to save the Storage Essentials credentials in this system account before executing this flow.

Note:

- The Storage Essentials user should have adequate permissions to access the necessary resources (hosts, arrays, fabric) and perform the provisioning actions on them.

- If Storage Essentials CMS is integrated with HP SIM, the **username** in the flow execution should be given in the same case as the **Login Name** on the **Security > Users** tab in the Storage Essentials GUI.
- The HPUX host name.
- The host credentials:
 - The host username.
 - The host password.

Host credentials are retrieved from the system account **HpuxServer** which is present in the OO Studio system accounts. The OO admin has to save the host credentials in this system account before executing this flow.

- The raw disk or volume name to be added to the ASM disk group.
- The Oracle database name.
- The database credentials:
 - The database user.
 - The database password.

Database credentials are retrieved from the system account **OracleHpux** which is present in the OO Studio system accounts. The OO admin has to save the database credentials in this system account before executing this flow.

Responses

- *success* – On successful completion of the flow, the new raw disk/volume will be added to the oracle ASM disk group.
- *failure* – The flow returns failure if the disk group alteration to add the new raw disk/volume fails.

System Account Reference

Update the inputs of the step **System Credentials**, in the **HPUX Oracle Provisioning – Expand Oracle Disk Group** flow with the system accounts listed here.

Input Name	System Account Name	Description
seUsername	SE	Storage Essentials login credential
sePassword	SE	Storage Essentials login credential
hpuxServerUsername	HpuxServer	HP-UX Server login credential
hpuxServerPassword	HpuxServer	HP-UX Server login credential
hpuxOracleUsername	OracleHpux	Oracle Application login credential on hpux system
hpuxOraclePassword	OracleHpux	Oracle Application login credential on hpux system

Note: These changes need to be done for every upgrade of operations Orchestration or whenever this flow is imported to Studio.

Provisioning–VMware

Flow: End–to–End VMware Storage Provisioning

This flow allows provisioning of storage volumes to a VMware virtual machine from storage arrays in a SAN environment and creating of a logical volume on the host out of this storage volume.

This flow uses the following subflows:

1. Create the VMFS volume on the VMware host.
2. Create the virtual disk on a VM.

Responses

- *success* – End–to–End VMware provisioning was successful.
- *failure* – End–to–End VMware provisioning failed.

Flow: Create VMFS Volume on VMware Host

This flow creates a VMFS volume on the ESX server from a storage volume provisioned to the host from any storage array in SAN. The steps involved are:

1. Rescan the vmhbas on the ESX server so it can see newly–provisioned storage volume.
2. Restart the VMware management service. This is so SE can return the paths to the newly–provisioned storage volume.
3. Do **Get All Element Details** for the ESX server to refresh the details in SE.
4. Get the path to the newly–provisioned storage volume through SE.
5. Get the new volume and create a new VMFS volume on the partition.

Inputs

- *hostname* – The ESX server on which the flow creates a new VMFS volume.
- *hostUser* – The host user name.
- *hostPassword* – The host password.
- *cms* – Storage Essentials (SE) Central Management Server (CMS) IP address.
- *user* – The CMS username.
- *password* – The CMS password.
- *volumeName* – The name of the storage volume which was provisioned to the host.
- *storagearray* – The name of the storage array from which the storage volume got provisioned for the host.

Responses

- *success* – The operation succeeded.
- *failure* – The operation failed.

Flow: Create Virtual Disk on a VM

This flow creates a virtual disk on a VM from a VMFS volume provisioned to the ESX server. The steps involved are:

1. Allow the user to select the virtual machine for which the flow will add a new virtual disk.
2. Create a new virtual disk on the VMFS volume.
3. Edit the config file for the selected VM to add the newly created virtual disk to the VM.

Inputs

- hostname – The ESX server on which the flow creates a new virtual disk.
- hostUser – The host user name.
- hostPassword – The host password.
- cms – The Storage Essentials (SE) Central Management Server (CMS) IP address.
- user – The CMS username.
- password – The CMS password.
- vmfsVolume – The name of the VMFS volume which got provisioned to the ESX server.

Responses

- *success* – The operation succeeded.
- *failure* – The operation failed.

Note:

Virtual Machine names having pipe “|” and single quotes “'” are not supported by this flow.

Storage Provisioning

Flow: Find Suitable Storage and Provision to Host

This flow allows provisioning of storage volumes to hosts from storage arrays in a SAN environment. The provisioning operation is done using the underlying Storage Essentials infrastructure, which manages the SAN environment.

Notes:

1. The flow supports Storage Essentials in Standalone mode as well as Storage Essentials integrated with HP SIM.
2. The flow supports provisioning only for the elements (fabric, storage devices) and configurations (such as Managed using SMI-S) supported by Storage Essentials.
For more details on supported configurations for provisioning, please refer to the Storage Essentials support matrix.
3. Currently, the flow supports HP MSA, HP EVA, XP family of arrays, LSI, HDS, IBM, EMC CLARiiON, and EMC Symmetrix arrays. There are no specific platform restrictions on the hosts to which storage can be assigned. Again, this is limited by the support matrix of Storage Essentials. The user will need to provide the Storage Essentials Central Management Server (CMS) details, including:

- The SE CMS name or IP address.
- The username.
- The password.

The Storage Essentials user should have adequate permissions to access the necessary resources (hosts, arrays, fabric) and perform the provisioning actions on them.

Note: If Storage Essentials CMS is integrated with HP SIM, the **username** in the flow execution should be given in the same case as the **Login Name** on the **Security > Users** tab in the Storage Essentials GUI.

4. The host for which storage needs to be provisioned.
5. Details of the volume to be created, including a name for the volume. This will be ignored by HP MSA, XP arrays, HDS and EMC Symmetrix, as the array will assign the volume name.
 - The size of the volume.
 - The desired redundancy level. The flow prompts for three levels:
 - Non-redundant Striped Volumes (RAID0)
 - Redundant Parity Based Volumes (e.g. RAID5)
 - Redundant Mirrored Volumes (RAID1)

Based on the desired volume characteristics, the flow intelligently finds an array in the SAN which can provide the volume with the desired characteristics and then provisions the Storage to the host.

Once the flow completes, the user needs to do hardware refresh operation on the host (for instance, rescan disks on Windows, ioscan on hpux) and then start using the storage.

In case the flow is not able to provision storage, it will try to revert all the changes it committed in the SAN environment as part of intermediate steps (for example, volume, HSG and zones created). This ensures that the flow tries to exit gracefully in case the provisioning operation is not successful.

Flow: Provision Storage to Host

This flow allows provisioning of storage volumes to hosts from given storage arrays in a SAN environment. The flow will try to provision on one of the storage arrays from given group of storage arrays.

The provisioning operation is done using the underlying Storage Essentials infrastructure, which manages the SAN environment.

Notes:

1. The flow supports Storage Essentials in Standalone mode as well as Storage Essentials integrated with HP SIM.
2. The flow supports provisioning only for the elements (fabric, storage devices) and configurations (such as Managed using SMI-S) supported by Storage Essentials.
For more details on supported configurations for provisioning, please refer to the Storage Essentials support matrix.
3. Currently, the flow supports HP MSA, HP EVA, XP family of arrays, LSI, HDS, IBM, EMC CLARiiON, and EMC Symmetrix arrays. There are no specific platform restrictions on the hosts to which storage can be assigned. Again, this is limited by the support matrix of Storage Essentials. The user will need to provide the Storage Essentials Central Management Server (CMS) details, including:
 - The SE CMS name or IP address.
 - The username.

- The password.

The Storage Essentials user should have adequate permissions to access the necessary resources (hosts, arrays, fabric) and perform the provisioning actions on them.

Note: If Storage Essentials CMS is integrated with HP SIM, the **username** in the flow execution should be given in the same case as the **Login Name** on the **Security > Users** tab in the Storage Essentials GUI.

4. Storage arrays list from which flow will provision on one of the storage array. All storage arrays should be in host's fabric.
5. The host for which storage needs to be provisioned.
6. The details of the volume which needs to be created, including a name for the volume. This will be ignored by HP MSA, XP arrays, HDS and EMC Symmetrix, as the array will assign the volume name.
 - The size of the volume.
 - The desired redundancy level. The flow prompts for three levels:
 - Non-redundant Striped Volumes (RAID0)
 - Redundant Parity Based Volumes (e.g. RAID5)
 - Redundant Mirrored Volumes (RAID1)

Based on the desired volume characteristics, the flow intelligently finds an array in the SAN which can provide the volume with the desired characteristics and then provisions the storage to the host.

Once the flow completes, the user needs to do a hardware refresh operation on the host (for example, rescan disks on Windows, ioscan on hpux) and then start using the storage.

In case the flow is not able to provision storage, it will try to revert all the changes it committed in the SAN environment as part of intermediate steps (for example, volume, HSG, and zones created). This ensures that the flow tries to exit gracefully in case the provisioning operation is not successful.

Flow: Provision Storage to the Selected Host

This flow allows provisioning of storage volumes to hosts from storage arrays in a SAN environment. The provisioning operation is done using the underlying Storage Essentials infrastructure, which manages the SAN environment.

Notes:

1. The flow supports Storage Essentials in Standalone mode as well as Storage Essentials integrated with HP SIM.
2. The flow supports provisioning only for the elements (fabric, storage devices) and configurations (such as Managed using SMI-S) supported by Storage Essentials.
For more details on supported configurations for provisioning, please refer to the Storage Essentials support matrix.
3. Currently, the flow supports HP MSA, HP EVA, XP family of arrays, LSI, HDS, IBM, EMC CLARiiON, and EMC Symmetrix arrays. There are no specific platform restrictions on the hosts to which storage can be assigned. Again, this is limited by the support matrix of Storage Essentials. The user will need to provide the Storage Essentials Central Management Server (CMS) details, including:
 - The SE CMS name or IP address.
 - The username.
 - The password.

The Storage Essentials user should have adequate permissions to access the necessary resources (hosts, arrays, fabric) and perform the provisioning actions on them.

Note: If Storage Essentials CMS is integrated with HP SIM, the **username** in the flow execution should be given in the same case as the **Login Name** on the **Security > Users** tab in the Storage Essentials GUI.

4. The host for which storage needs to be provisioned.
 - The flow displays all of the hosts managed by Storage Essentials CMS. The user will need to select the host.
5. The details of the volume to be created. This includes:
 - A name for the volume. This will be ignored by HP MSA, XP arrays, and HDS, and EMC Symmetrix, as the array will assign the volume name.
 - The size of the volume
 - The desired redundancy level. The flow prompts for three levels:
 - Non-redundant Striped Volumes (RAID0)
 - Redundant Parity Based Volumes (e.g. RAID5)
 - Redundant Mirrored Volumes (RAID1)

Based on the desired volume characteristics, the flow intelligently finds an array in the SAN which can provide the volume with the desired characteristics, and then provisions the storage to the host.

Once the flow completes, the user must do a hardware refresh operation on the host (for instance, rescan disks on Windows, ioscan on hpux) and then start using the storage.

In case the flow is not able to provision storage, it will try to revert all the changes it committed in the SAN environment as part of intermediate steps (for instance, volume, HSG, and zones created). This ensures that the flow can exit gracefully in case the provisioning operation is not successful.

Flow: Provision Storage to Host – Create Change Ticket

This flow creates a change ticket in HP Service Manager with the inputs provided by the user requesting to provision storage volumes to hosts.

Ecosystem Applications

This flow uses the following applications:

- *HP Storage Essentials* – This flow uses this application for adding or removing the HBA port from the storage volume ACL in the given storage system.
- *HP Service Manager(SM)* – This flow uses this application for creating the change ticket required by the above mentioned flows.

Notes:

- For creating a change ticket on HP Service Manager using the **Provision Storage to host – Create Change Ticket** flow, the column width of the **misc1** and **misc3** fields in the **cm3r** table in HP Service Manager's database should be modified.
- Only an admin user can modify the HP Service Manager Database configuration.
- The following are the steps for modifying the column width of the **misc1** and **misc3** fields in the **cm3r** table in HP Service Manager's database.
 1. Log on to the Service Manager Client application with administrator credentials.
 - h. Locate the table **cm3r** under Connection – <logged in user>–>System Definition –> Tables.

- i. Click on **Fields** under **cm3r**.
- j. The Fields and Keys definitions for cm3r table window appear in the right pane.
- k. Under the **Fields** section, locate the **middle->misc1** field.
- l. Under the **SQL Mapping** section, change the **SQL data type** to **TEXT** for the field **misc1**.
- m. Under the **Fields** section, locate **the middle->misc3** field.
- n. Under the **SQL Mapping** section, change the **SQL data length** to **255** for the field **misc3**.
- o. Save your changes to the database by selecting the **Save** button in the left corner of the pane.

Inputs

- Storage Essentials Central Management Server (CMS) details, including:
 - The SE CMS name or IP address.
 - The username.
 - The password.

These are administrative inputs, so the OO admin user may want to statically configure them in Studio to hide them from non-admin users of the OO Central interface.

Notes:

- The HP Storage Essentials user should have adequate permissions to access the necessary resources (hosts, arrays, fabric) and perform the provisioning actions on them.
- If Storage Essentials CMS is integrated with HP SIM, the **username** in the flow execution should be given in the same case as the **Login Name** on the **Security > Users** tab in the Storage Essentials GUI.
- The name or IP address of the host for which storage needs to be provisioned.
- A name for the storage volume. This will be ignored by HP MSA, XP arrays, HDS and EMC Symmetrix DMX, as the array will assign the volume name.
- The size of the volume.
- The desired redundancy level. The flow prompts the user to choose from one of the following three levels:
 - Non-redundant Striped Volumes (RAID0)
 - Redundant Parity Based Volumes (RAID5)
 - Redundant Mirrored Volumes (RAID1)
- For creation of the ticket, the user needs to provide the Service Manager server information including:
 - The SM server name or IP address.
 - The username.
 - The password.

The above three are administrative inputs, so the OO admin user may want to statically configure them in Studio to hide them from non-admin users of the OO Central interface.

- The protocol type (HTTPS/HTTP).
- The TCP Port (default ports for SM are 13443/13080).
- Contact.
- Coordinator.
- Requested By.

Responses

- *success* – On successful completion of the flow, a change ticket will be created on HP Service Manager with Storage Provisioning details for approval from Storage Administrator.
- *failure* – The flow returns failure in case of error.

Flow: Provision Storage to Host – Execute using Change Ticket

This flow integrates the provisioning operation with the Change Management functionality of HP Service Manager. This flow provisions storage volumes to hosts from storage arrays in a SAN environment using the information in the approved change ticket of Service Manager, created by the **Provision Storage to host – Create Change Ticket** flow. After successful completion of provisioning of storage to host, the SE CIs are updated on uCMDB based on user request. The provisioning operation is done using the underlying Storage Essentials infrastructure, which manages the SAN environment.

Ecosystem Applications

This flow uses the following applications:

- *HP Storage Essentials* – This flow uses this application for adding or removing the HBA port from the storage volume ACL in the given storage system.
- *HP Service Manager(SM)* – This flow uses this application for creating the change ticket required by the above mentioned flows.
- *HP uCMDB*– This flow uses this application for refreshing the CMDB with the changes introduced in the SAN using the Storage Essential application.

Inputs

- The SM server details:
 - The SM server name or IP address.
 - The username.
 - The password.

The above are administrative inputs, so the OO admin user may want to statically configure them in Studio to hide them from non-admin users of the OO Central interface.
- The protocol type (HTTPS/HTTP).
- The TCP Port (default ports for SM are 13443/13080).
- The change ticket ID (Ticket should be approved).
- The Storage Essentials Central Management Server (CMS) details, including:
 - The username.
 - The password.

These are administrative inputs, so the OO admin user may want to statically configure them in Studio to hide them from non-admin users of the OO Central interface.

Notes:

- The Storage Essentials user should have adequate permissions to access the necessary resources (hosts, arrays, fabric) and perform the provisioning actions on them.

- If Storage Essentials CMS is integrated with HP SIM, the **username** in the flow execution should be given in the same case as the **Login Name** on the **Security > Users** tab in the Storage Essentials GUI.
- The uCMDB server details:
 - The uCMDB server name or IP address.
 - The username.
 - The password.

The above are administrative inputs, so the OO admin user may want to statically configure them in Studio to hide them from non-admin users of the OO Central interface.
- Whether or not to specify that it is required to update the SE CIs on uCMDB (“Yes” or “No”).

Responses

- *success* – On successful completion of the flow, storage will be provisioned to the host requested in the change ticket. After successful provisioning of storage to the requested host, the changes in the SAN will be updated to uCMDB.
- *failure* – The flow returns failure in the case of error.

Flow: Provision Storage to Host – Update and Approve Change Ticket and Execute

This flow integrates provisioning operation with the Change Management functionality of HP Service Manager. This flow allows Storage Administrator to update and approve the storage provisioning details in the HP Service Manager Change Ticket created using the **Provision Storage to host – Create Change Ticket** flow. This flow also allows the Storage Administrator to continue with the execution of storage provisioning to the host using the **Provision Storage to host – Execute using Change Ticket** flow.

Ecosystem Applications

This flow uses the following applications:

- *HP Storage Essentials* – This flow uses this application for adding or removing the HBA port from the storage volume ACL in the given storage system.
- *HP Service Manager(SM)* – This flow uses this application for creating the change ticket required by the above mentioned flows.
- *HP uCMDB*– This flow uses this application for refreshing the CMDB with the changes introduced in the SAN using the Storage Essential application.

Inputs

- The SM server details:
 - The SM server name or IP address.
 - The username.
 - The password.

The above are administrative inputs, so the OO admin user may want to statically configure them in Studio to hide them from non-admin users of the OO Central interface.

- The protocol type (HTTPS/HTTP).

- The TCP Port (default ports for SM are 13443/13080).
- The change ticket ID (Ticket to be updated and approved).
- Approval or denial of the ticket (“approve” or “deny”).
- Whether to execute storage provisioning to the host (“Yes” or “No”).
- The Storage Essentials Central Management Server (CMS) details, including:
 - The username.
 - The password.

These are administrative inputs, so the OO admin user may want to statically configure them in Studio to hide them from non-admin users of the OO Central interface.

Notes:

- The Storage Essentials user should have adequate permissions to access the necessary resources (hosts, arrays, fabric) and perform the provisioning actions on them.
- If Storage Essentials CMS is integrated with HP SIM, the **username** in the flow execution should be given in the same case as the **Login Name** on the **Security > Users** tab in the Storage Essentials GUI.
- The uCMDB server details:
 - The uCMDB server name or IP address.
 - The username.
 - The password.

The above are administrative inputs, so the OO admin user may want to statically configure them in Studio to hide them from non-admin users of the OO Central interface.
- Whether updating the SE CIs on uCMDB is required or not (“Yes” or “No”).

Responses

- *success* – On successful completion of the flow, the change ticket will be updated, approved, and storage will be provisioned to the host requested in the change ticket. After successful provisioning of storage to the requested host, the changes in the SAN will be updated to uCMDB.
- *failure* – The flow returns failure in case of error.

Note:

This flow does not support headless/REST execution.

Replace HBA

Flow: Replace HBA

This flow allows the HBA port WWN to be updated in a SAN environment and refreshes uCMDB for updating SE CIs on uCMDB. It will try to replace HBA port WWN in all host security groups (HSGs), Zones, and Zone Aliases.

This flow uses following subflows:

- **Replace HBA in host security groups**

This flow will collect all storage systems that are mapped to the old HBA port WWN (storage systems where host security groups exist on the old WWN).

The flow will collect all HSGs which exist in mapped storage systems.

The flow will try to add a new HBA port to the existing HSG and remove the old HBA port from this HSG. If the flow fails to add a new HBA port to the HSG, the flow will try to create a new HSG (with the new HBA port WWN and other details from the existing HSG) and delete the existing HSG.

The flow will try to delete the HSG or remove the old HBA port WWN from the HSG only when it is able to create the new HSG or add the new HBA port wan to the existing HSG.

- **Replace HBA in Zones**

This flow will collect all the zones and zone aliases in the fabric of the old HBA port wan.

The flow will add a new HBA port WWN in all zones and aliases and remove the old HBA port WWN from all zones and aliases.

The flow will try to remove the old HBA port WWN from zone or zone aliases only when it is able to add a new HBA port WWN in the zone or alias.

Ecosystem Applications

This flow uses the following application for doing the operations:

- *Storage Essentials* – This flow uses SE to do all HSG and zone related changes.

Inputs

- The Storage Essentials Central Management Server details, including:
 - The SE CMS name or IP address.
 - The username.
 - The password.

These are administrative inputs, so the OO admin user may want to statically configure them in Studio to hide them from non-admin users of the OO Central interface.

Notes:

- The Storage Essentials user should have adequate permissions to access the necessary resources (hosts, arrays, fabric) and perform the provisioning actions on them.
- If Storage Essentials CMS is integrated with HP SIM, the **username** in the flow execution should be given in the same case as the **Login Name** on the **Security > Users** tab in the Storage Essentials GUI.
- The host for which the HBA port WWN needs to be replaced.
- The old HBA port WWN that needs to be replaced.
- The new HBA port WWN that will replace the old WWN.
- The user will need to provide the uCMDB Server details, including:
 - The uCMDB Server IP address.
 - The username.
 - The password.
- Whether to refresh uCMDB ("Yes" or "No").

Responses

- *success* – On successful completion of the flow, HBA port WWN will be replaced in all HSGs, zones, and zone aliases.
- *warning* – If the flow fails to replace the HBA port WWN in at least one HSG/zone/zone alias.

- *failure* – The flow returns failure if it fails to replace the HBA port WWN in all HSGs, zones, and zone aliases.

Flow: Replace HBA in Host Security Groups

This flow allows users to replace the HBA port WWN in all host security groups in a SAN environment. It collects all storage systems which are mapped with the old HBA port WWN (storage systems where host security groups exist with the old WWN). It also collects all HSGs which exist in mapped storage systems.

The flow will try to add the new HBA port to the existing HSG and remove the old HBA port from this HSG. If the flow fails to add the new HBA port to the HSG, then the flow will try to create a new HSG (with the new HBA port WWN and other details from the existing HSG) and delete the existing HSG.

It will also try to delete the HSG or remove the old HBA port WWN from the HSG only when it is able to create the new HSG or add the new HBA port WWN to the existing HSG.

Ecosystem Applications

This flow uses the following application for doing the operations:

- *Storage Essentials* – This flow uses SE to do all HSG-related changes.

Inputs

- The Storage Essentials Central Management Server details, including:
 - The SE CMS name or IP address.
 - The username.
 - The password.

These are administrative inputs, so the OO admin user may want to statically configure them in Studio to hide them from non-admin users of the OO Central interface.

Notes:

- The Storage Essentials user should have adequate permissions to access the necessary resources (hosts, arrays, fabric) and perform the provisioning actions on them.
- If Storage Essentials CMS is integrated with HP SIM, the **username** in the flow execution should be given in the same case as the **Login Name** on the **Security > Users** tab in the Storage Essentials GUI.
- The host for which the HBA port WWN needs to be replaced.
- The old HBA port WWN that needs to be replaced.
- The new HBA port WWN that will replace the old WWN.

Responses

- *success* – On successful completion of the flow, the HBA port WWN will be replaced in all HSGs.
- *warning* – If the flow fails to replace the HBA port WWN in at least one HSG.
- *failure* – The flow returns failure if it fails to replace the HBA port WWN on all HSGs.

Flow: Replace HBA in Zones

This flow allows users to replace the HBA port WWN in all zones and zone aliases in a SAN environment. It collects all the zones and zone aliases in the fabric with the old HBA port WWN.

The flow will also add new the HBA port WWN in all zones and aliases and remove the old HBA port WWN from all zone and aliases. It will also try to remove the old HBA port WWN from a zone or zone alias only when it is able to add the new HBA port WWN in the zone or alias.

Ecosystem Applications

This flow uses the following application for doing the operations:

- *Storage Essentials* – This flow uses SE to do all zone–related changes.

Inputs

- The Storage Essentials Central Management Server details, including:
 - The SE CMS name or IP address.
 - The username.
 - The password.

These are administrative inputs, so the OO admin user may want to statically configure them in Studio to hide them from non–admin users of the OO Central interface.

Notes:

- The Storage Essentials user should have adequate permissions to access the necessary resources (hosts, arrays, fabric) and perform the provisioning actions on them.
- If Storage Essentials CMS is integrated with HP SIM, the **username** in the flow execution should be given in the same case as the **Login Name** on the **Security > Users** tab in the Storage Essentials GUI.
- The old HBA port WWN that needs to be replaced.
- The new HBA port WWN that will replace the old WWN.

Responses

- *success* – On successful completion of the flow, the HBA port WWN will be replaced in all zones and zone aliases.
- *warning* – If the flow fails to replace the HBA port WWN in at least one zone/zone alias.
- *failure* – The flow returns failure if it fails to replace the HBA port WWN in all zones and zone aliases.

Flow: Replace HBA – Create Change Ticket

This flow creates a change ticket in HP Service Manager with the inputs provided by the user requesting to replace HBA port WWN.

Ecosystem Applications

This flow uses the following applications for doing the operations:

- *Storage Essentials* – This flow uses SE to get fabric for the new HBA port WWN.
- *HP Service Manager(SM)* – This flow uses SM to create the change ticket.

Inputs

- The Storage Essentials Central Management Server details, including:
 - The SE CMS name or IP address.
 - The username.
 - The password.

These are administrative inputs, so the OO admin user may want to statically configure them in Studio to hide them from non-admin users of the OO Central interface.

Notes:

- The Storage Essentials user should have adequate permissions to access the necessary resources (hosts, arrays, fabric) and perform the provisioning actions on them.
- If Storage Essentials CMS is integrated with HP SIM, the **username** in the flow execution should be given in the same case as the **Login Name** on the **Security > Users** tab in the Storage Essentials GUI.
- The host for which the HBA port WWN needs to be replaced.
- The old HBA port WWN that needs to be replaced.
- The new HBA port WWN that will replace the old WWN.
- To execute the ticket, the user will need to provide the Service Manager server information, including:
 - The SM server name or IP address.
 - The username.
 - The password.
 - The protocol type (HTTPS/HTTP).
 - The TCP Port (default ports for SM are 13443/13080).

These are administrative inputs, so the OO admin user may want to statically configure them in Studio to hide them from non-admin users of the OO Central interface.

Responses

- *success* – On successful completion of the flow, a change ticket will be created on HP Service Manager with Replace HBA details for approval from the Storage Administrator.
- *failure* – The flow returns failure in case of error.

Flow: Replace HBA – Execute Using Change Ticket

This flow integrates the **Replace HBA** operation with the Change Management functionality of HP Service Manager. This flow replaces the HBA in a SAN environment using the information in the approved change ticket of Service Manager, created by the **Replace HBA – Create Change Ticket** flow.

This flow uses the following subflow:

- **Replace HBA** – This flow will replace the HBA port wan in all HSGs, zones and zone aliases in a SAN environment.

Ecosystem Applications

This flow uses the following applications for doing the operations:

- *Storage Essentials* – This flow uses SE to do all HSG and Zone related changes.
- *HP Service Manager(SM)* – This flow uses SM to get change ticket details.

Inputs

- To execute the ticket, the user must provide the Service Manager server information, including:
 - The SM server name or IP address.
 - The username.
 - The password.
 - The protocol type (HTTPS/HTTP).
 - The TCP Port (default ports for SM are 13443/13080).

These are administrative inputs, so the OO admin user may want to statically configure them in Studio to hide them from non-admin users of the OO Central interface.

- The change ticket ID (the ticket should be approved).
- The Storage Essentials Central Management Server (CMS) details, including:
 - The SE CMS name or IP address.
 - The username.
 - The password.

These are administrative inputs, so the OO admin user may want to statically configure them in Studio to hide them from non-admin users of the OO Central interface.

Notes:

- The Storage Essentials user should have adequate permissions to access the necessary resources (hosts, arrays, fabric) and perform the provisioning actions on them.
- If Storage Essentials CMS is integrated with HP SIM, the **username** in the flow execution should be given in the same case as the **Login Name** on the **Security > Users** tab in the Storage Essentials GUI.

Responses

- *success* – On successful completion of the flow, the HBA port WWN will be replaced in all HSGs, zones, and zone aliases in the SAN environment requested in the change ticket and the ticket will be closed.
- *failure* – The flow returns failure in case of error.

Flow: Replace HBA – Approve Change Ticket and Execute

This flow integrates the provisioning operation with the Change Management functionality of HP Service Manager. This flow allows Storage Administrator to approve the change ticket created using the **Replace HBA – Create Change Ticket** flow. This flow also allows the Storage Administrator to continue with the execution of **Replace HBA** using the **Replace HBA – Execute using Change Ticket** flow.

This flow uses the following subflow:

- **Replace HBA – Execute Change Ticket** – This flow will replace the HBA port wwn in all HSGs, zones, and zone aliases in a SAN environment using the details from the change ticket.

Ecosystem Applications

This flow uses the following applications for doing the operations:

- *Storage Essentials* – This flow uses SE to do all HSG and Zone related changes.
- *HP Service Manager(SM)* – This flow uses SM to get change ticket details.

Inputs

- To execute the ticket, the user must provide the Service Manager server information, including:
 - The SM server name or IP address.
 - The username.
 - The password.
 - The protocol type (HTTPS/HTTP).
 - The TCP Port (default ports for SM are 13443/13080).

These are administrative inputs, so the OO admin user may want to statically configure them in Studio to hide them from non-admin users of the OO Central interface.

- The change ticket ID (the ticket to be approved).
- Execute Replace HBA or not (“Yes” or “No”).
- Approve or deny the ticket (“approve” or “deny”).
- The Storage Essentials Central Management Server (CMS) details, including:
 - The SE CMS name or IP address.
 - The username.
 - The password.

These are administrative inputs, so the OO admin user may want to statically configure them in Studio to hide them from non-admin users of the OO Central interface.

Notes:

- The Storage Essentials user should have adequate permissions to access the necessary resources (hosts, arrays, fabric) and perform the provisioning actions on them.
- If Storage Essentials CMS is integrated with HP SIM, the **username** in the flow execution should be given in the same case as the **Login Name** on the **Security > Users** tab in the Storage Essentials GUI.

Responses

- *success* – On successful completion of the flow, the change ticket will be approved and the HBA port WWN will be replaced in all HSGs, zones, and zone aliases in the SAN environment requested in the change ticket, and the ticket is closed (if the user selected “Yes” to execute).
- *failure* – The flow returns failure in case of error.

Utility

Flow: Delete Host Security Groups

This flow allows the user to delete all HSGs given as input. It iterates on the list of HSG Mapping provided and deletes HSGs present in the list one by one. An example of HSG mapping is hsg1,(h1,h2),(s1,s2)|hsg2,(h2)(s3,s4).....

Here:

hsg1, hsg2 are name of the HSGs,
h1, h2, h3..... are HBA port WWNs, and
s1, s2, s3..... are storage system port WWNs .

Note:

When an HSG is deleted, all the array volumes exposed to a host through this HSG will become inaccessible.

Ecosystem Applications

This flow uses the following application for doing the operations:

- *Storage Essentials* – This flow uses SE to delete all HSGs.

Inputs

- The Storage Essentials Central Management Server details, including:
 - The SE CMS name or IP address.
 - The username.
 - The password.

These are administrative inputs, so the OO admin user may want to statically configure them in Studio to hide them from non-admin users of the OO Central interface.

Notes:

- The Storage Essentials user should have adequate permissions to access the necessary resources (hosts, arrays, fabric) and perform the provisioning actions on them.
- If Storage Essentials CMS is integrated with HP SIM, the username in the flow execution should be given in the same case as the **Login Name** on the **Security > Users** tab in the Storage Essentials GUI.
- The storage system for which the HSGs need to be deleted.
- The HSG names to be deleted.
- The delimiter used to separate the HSG names.

Responses

- *success* – On successful completion of the flow, at least one HSG will be deleted.
- *failure* – The flow returns failure if fails to delete at least one HSG.

Flow: Find Arrays in Zone with Host

This flow retrieves all of the storage systems that are in the zone with the host provided. The steps involved are:

1. The flow retrieves the HBA port information for the given host.
2. The flow iterates over the HBA Port WWN and finds out the list of storage systems which are in the zone with the HBA port WWN.
3. The flow merges the lists into a single storage system list separated by the special character pipe "|". As the same storage system can be exposed to a host through multiple zones, the merged list avoids duplicates and allows only one entry for a storage system in the list.

Ecosystem Applications

This flow uses the following application for doing the operations:

- *Storage Essentials* – This flow uses SE to retrieve storage system and zoning details.

Inputs

- The Storage Essentials Central Management Server details, including:
 - The SE CMS name or IP address.
 - The username.
 - The password.

These are administrative inputs, so the OO admin user may want to statically configure them in Studio to hide them from non-admin users of the OO Central interface.

Notes:

- The Storage Essentials user should have adequate permissions to access the necessary resources (hosts, arrays, fabric) and perform the provisioning actions on them.
- If Storage Essentials CMS is integrated with HP SIM, the username in the flow execution should be given in the same case as the Login Name on the **Security > Users** tab in the Storage Essentials GUI.
- The host for which the user wants to retrieve the storage systems in the zone.

Results

- *mergedList* – a pipe "|" separated list of storage system which are in the zone with the host.

Responses

- *success* – On successful completion of the flow, a merged list of storage systems which are in the zone with the given host will be returned.
- *failure* – The flow returns failure in case of error.

Flow: Find Arrays not in Zone with Host

This flow allows to retrieves all the storage systems which are not in zone with the host provided. The steps involved are:

1. Retrieve the HBA port information for the given host.
2. Iterate over the HBA Port WWN and find out the list of storage systems which are not in zone with the HBA Port WWN.
3. Merge the lists into a single storage system list separated by a special character pipe "|". As a same storage system can be exposed to a host through multiple zones, the merged list avoids duplicates and allows only one entry for a storage system in the list.

Ecosystem Applications

This flow uses the following application for doing the operations:

- *Storage Essentials* – This flow uses SE to retrieve storage system and zoning details.

Inputs

- The Storage Essentials Central Management Server details, including:
 - The SE CMS name or IP address.
 - The username.
 - The password.

These are administrative inputs, so the OO admin user may want to statically configure them in Studio to hide them from non-admin users of the OO Central interface.

Notes:

- The Storage Essentials user should have adequate permissions to access the necessary resources (hosts, arrays, fabric) and perform the provisioning actions on them.
- If Storage Essentials CMS is integrated with HP SIM, the username in the flow execution should be given in the same case as the **Login Name** of the **Security > Users** tab in the Storage Essentials GUI.
- The host for which the user wants to retrieve the storage systems not in the zone.

Results

- mergedList – pipe "|" separated list of storage systems which are not in the zone with the host.

Responses

- success – On successful completion of the flow, a merged list of storage systems which are not in the zone with the given host will be returned.
- failure – The flow returns failure in case of error.

Flow: Refresh Element Details

This flow refreshes the element details of the element name provided. The steps involved are:

1. The flow checks whether another element refresh is in progress. If it is, it waits for 10 seconds and then checks whether the in-progress element refresh is complete.
This wait cycle continues till the element refresh in progress finishes.
2. The flow starts the refresh element details for the element name provided.
3. The flow waits until the element refresh is complete.

Ecosystem Applications

This flow uses the following application for doing the operations:

- *Storage Essentials* – This flow uses SE to refresh element details.

Inputs

- The Storage Essentials Central Management Server details, including:
 - The SE CMS name or IP address.
 - The username.
 - The password.

These are administrative inputs, so the OO admin user may want to statically configure them in Studio to hide them from non-admin users of the OO Central interface.

Notes:

- The Storage Essentials user should have adequate permissions to access the necessary resources (hosts, arrays, fabric) and perform the provisioning actions on them.
- If Storage Essentials CMS is integrated with HP SIM, the username in the flow execution should be given in the same case as the **Login Name** of the **Security > Users** tab in the Storage Essentials GUI.
- The element name for which the user wants to refresh details.
- The type of element for which the refresh needs to be done (for example, storage system, host, or switch).

Responses

- *success* – On successful completion of the flow, data for the given element will be refreshed.
- *failure* – The flow returns failure in case of error.

Flow: Get All Element Details

This flow updates the details of the input element on Storage Essentials, using the underlying Storage Essentials infrastructure.

Ecosystem Applications

This flow uses the following application:

- HP Storage Essentials – This flow uses this application for refreshing element details.

Inputs

- The Storage Essentials Central Management Server details, including:
 - The SE CMS name or IP address.
 - The username.
 - The password.

These are administrative inputs, so the OO admin user may want to statically configure them in Studio to hide them from non-admin users of the OO Central interface.

Notes:

- The HP Storage Essentials user should have adequate permissions to access the necessary resources (hosts, arrays, fabric) and perform the provisioning actions on them.
- If HP Storage Essentials CMS is integrated with HP SIM, the domain\username in the flow execution should be specified in the *same case* as the logged-on user information displayed in the SE GUI, as highlighted below.
- The name of the element to be refreshed on Storage Essentials.
- The type of the element to be refreshed on Storage Essentials.

Responses

- *success* – On successful completion of the flow, the input element will be updated on Storage Essentials.
- *failure* – The flow returns failure if the input element is not updated on Storage Essentials.

Flow: Refresh SE on uCMDB

This flow updates/refreshes HP Storage Essentials CIs on uCMDB.

Ecosystem Applications

This flow uses the following applications:

- *HP Storage Essentials* – This flow uses this application for adding or removing the HBA port from the storage volume ACL in the given storage system.
- *HP uCMDB*– This flow uses this application for refreshing the CMDB with the changes introduced in the SAN using the Storage Essential application.

Inputs

- The Storage Essentials Central Management Server details, including:
 - The SE CMS name or IP address.
 - The username.
 - The password.

These are administrative inputs, so the OO admin user may want to statically configure them in Studio to hide them from non-admin users of the OO Central interface.

Notes:

- The HP Storage Essentials user should have adequate permissions to access the necessary resources (hosts, arrays, fabric) and perform the provisioning actions on them.
- If HP Storage Essentials CMS is integrated with HP SIM, the domain\username in the flow execution should be specified in the *same case* as the logged-on user information displayed in the SE GUI, as highlighted below.
- The uCMDB server details:
 - The uCMDB server name or IP address.
 - The username.

- The password.

The above are administrative inputs, so the OO admin user may want to statically configure them in Studio to hide them from non-admin users of the OO Central interface.

Responses

- *success* – On successful completion of the flow, uCMDB will be updated with all the changes in the SAN.
- *failure* – The flow returns failure in case of error.

Zoning

Flow: Create and Activate Zone(s)

This flow creates a zone with the fabric port list and activates the created zone, using the underlying Storage Essentials infrastructure.

Ecosystem Applications

This flow uses the following application:

- *HP Storage Essentials* – This flow uses this application for creating and activating the zone.

Inputs

- The Storage Essentials Central Management Server details, including:
 - The SE CMS name or IP address.
 - The username.
 - The password.

These are administrative inputs, so the OO admin user may want to statically configure them in Studio to hide them from non-admin users of the OO Central interface.

Notes:

- The HP Storage Essentials user should have adequate permissions to access the necessary resources (hosts, arrays, fabric) and perform the provisioning actions on them.
- If HP Storage Essentials CMS is integrated with HP SIM, the domain\username in the flow execution should be specified in the *same case* as the logged-on user information displayed in the SE GUI, as highlighted below.
- The name of the zone to be created.
- The list of ports/WWNs to be added to the zone.
- The delimiter for the fabric port list. The default delimiter is "|".

Results

- The name of the created zone.

Responses

- *success* – On successful completion of the flow, the zone will be created and activated.
- *failure* – The flow returns failure if zone creation or activation fails.

Flow: Create Zone with Multiple Inputs

This flow creates a zone with the WWN and zone alias list provided as input. The flow uses the underlying HP Storage Essentials infrastructure, which manages the SAN environment.

Ecosystem Applications

This flow uses the following application:

- *HP Storage Essentials* – This flow uses this application for creating and updating zones.

Inputs

- The Storage Essentials Central Management Server details, including:
 - The SE CMS name or IP address.
 - The username.
 - The password.

These are administrative inputs, so the OO admin user may want to statically configure them in Studio to hide them from non-admin users of the OO Central interface.

Notes:

- The HP Storage Essentials user should have adequate permissions to access the necessary resources (hosts, arrays, fabric) and perform the provisioning actions on them.
- If HP Storage Essentials CMS is integrated with HP SIM, the domain\username in the flow execution should be specified in the *same case* as the logged-on user information displayed in the SE GUI, as highlighted below.
- The name of the fabric on which the zone set has to be created.
- The name of the zone to be created on the given fabric.
- The list of WWNs and zone alias names separated by "|", to be added to the zone.

Note:

- Zone creation does not support Switch port WWNs.

Results

- The name of the created zone.
- The list of WWN/Alias added to the created zone.
- The list of WWN/Alias not added to the created zone.

Responses

- *success* – On successful completion of the flow, the zone will be created with all WWN/zone aliases in the input list.
- *failure* – The flow returns failure if no zone is created with the WWN/zone alias in the input list.

- *Warning* – The flow returns warning if it fails to add at least one WWN/zone alias in the input list.
- *zoning not enabled* – The flow returns zoning not enabled when the zoning feature is not enabled on the fabric.

Flow: Create Zone Set with Multiple Inputs

This flow creates a zone set with the zone list provided as input, using the underlying Storage Essentials infrastructure.

Ecosystem Applications

This flow uses the following application:

- *HP Storage Essentials* – This flow uses this application for creating and updating the zone set.

Inputs

- The Storage Essentials Central Management Server details, including:
 - The SE CMS name or IP address.
 - The username.
 - The password.

These are administrative inputs, so the OO admin user may want to statically configure them in Studio to hide them from non-admin users of the OO Central interface.

Notes:

- The HP Storage Essentials user should have adequate permissions to access the necessary resources (hosts, arrays, fabric) and perform the provisioning actions on them.
- If HP Storage Essentials CMS is integrated with HP SIM, the domain\username in the flow execution should be specified in the *same case* as the logged-on user information displayed in the SE GUI, as highlighted below.
- The name of the fabric on which the zone set has to be created.
- The name of the zone set to be created on the given fabric.
- The list of zone names separated by "|", to be added to the zone set.

Results

- The name of the created zone set.
- The list of zones added to the created zone set.
- The list of zones not added to the created zone set.

Responses

- *success* – On successful completion of the flow, the Zone Set will be created with all zones in the input list.
- *failure* – The flow returns failure if no Zone Set is created with the zones in the input list.
- *warning* – The flow returns warning if it fails to add at least one zone in the input list.

Flow: Create Zone Alias with Multiple Inputs

This flow creates a zone alias with the WWN list provided as input, using the underlying Storage Essentials infrastructure.

Ecosystem Applications

This flow uses the following application:

- *HP Storage Essentials* – This flow uses this application for creating and updating the zone alias.

Inputs

- The Storage Essentials Central Management Server details, including:
 - The SE CMS name or IP address.
 - The username.
 - The password.

These are administrative inputs, so the OO admin user may want to statically configure them in Studio to hide them from non-admin users of the OO Central interface.

Note:

- The HP Storage Essentials user should have adequate permissions to access the necessary resources (hosts, arrays, fabric) and perform the provisioning actions on them.
- If HP Storage Essentials CMS is integrated with HP SIM, the domain\username in the flow execution should be specified in the *same case* as the logged-on user information displayed in the SE GUI, as highlighted below.
- The name of the fabric on which the zone alias has to be created.
- The name of the zone alias to be created on the given fabric.
- The list of WWNs separated by "|", to be added to the zone alias.

Note:

- The zone alias creation does not support switch port WWNs.

Results

- The name of the created zone alias.
- The list of WWNs added to the created zone alias.
- The list of WWNs not added to the created zone alias.

Responses

- *success* – On successful completion of the flow, the zone alias will be created with all WWNs in the input list.
- *failure* – The flow returns failure if no zone set is created with the WWNs in the input list.
- *warning* – The flow returns warning if it fails to add at least one WWN in the input list.
- *zoning not enabled* – The flow returns zoning not enabled when the zoning feature is not enabled on the fabric.

Storage Automation operations

The **Storage Automation** operations—all based on Storage Essentials—are available as part of the Storage Automation Toolkit.

In OO Studio, the Storage Automation operations are located in the **\Library\Integrations\Hewlett-Packard\Storage Automation** folder. The Storage Automation operations are organized in the following folders:

- Deprecated
- SSH
- Storage Automation Toolkit
- Telnet
- Utility Operations
- Windows Utility

Operation: Identify Critical Links for Application

This operation identifies the critical links for an application. A critical link is a link that causes application downtime when it is removed.

Inputs

- `seCMSIP` – The Storage Essentials (SE) Central Management Server (CMS) IP address.
- `seUser` – The CMS username.
- `sePassword` – The CMS password.
- `applicationName` – The application name.
- `hostName` – The host name.

Responses

- *no risk* – The operation has succeeded with response **no risk**.
- *risk* – The operation has succeeded with response **risk**.
- *failure* – The operation has failed.

Results

- *status* – The actual status message, which describes the success or failure of the operation. In case of failure, this will have the actual error message as described in the Error Codes section.
- *errorCode* – The integer value, which describes the actual error code. An error detail for each error code is given in the Error Codes section.
- *invalidInputParameter* – This will have the invalid input parameter name when the return code is 1 or 2.
- *links* – A list of links separated by the character "|".

Note:

- A link is the connectivity between devices (HBA port to host, host to switch, switch to switch, switch to storage system).

Operation: Identify Critical Links for Host

This operation identifies the critical links for the host. A critical link is a link that causes loss of connectivity between the host and a storage device when it is removed.

Inputs

- seCMSIP – The Storage Essentials (SE) Central Management Server (CMS) IP address.
- seUser – The CMS username.
- sePassword – The CMS password.
- hostName – The host name.

Responses

- *no risk* – The operation succeeded with response **no risk**.
- *risk* – The operation succeeded with response **risk**.
- *failure* – The operation failed.

Results

- *status* – The actual status message, which describes the success or failure of the operation. In case of failure, this will have the actual error message as described in the Error Codes section.
- *errorCode* – The integer value that describes the actual error code. An error detail for each *errorCode* is given in the Error Codes section.
- *invalidInputParameter* – This will have the invalid input parameter name when the return code is 1 or 2.
- *links* – The list of links separated by the special character "|".

Note:

- A link is connectivity between devices (for example, HBA port to host, host to switch, switch to switch, switch to storage system).

Operation: Identify Critical Switches for Application

This operation identifies the critical switches for the application. A critical switch is a switch that causes application downtime when it is removed.

Inputs

- seCMSIP – The Storage Essentials (SE) Central Management Server (CMS) IP address.
- seUser – The CMS username.
- sePassword – The CMS password
- applicationName – The application name.
- hostName – The host name.

Responses

- *no risk* – The operation is successful with the response **no risk**.

- *risk* – The operation is successful with the response **risk**.
- *failure* – The operation failed.

Results

- *status* – The actual status message, which describes the success or failure of the operation. In case of failure, this will have the actual error message as described in the Error Codes section.
- *errorCode* – The integer value that describes the actual error code. An error detail for each *errorCode* is given in the Error Codes section.
- *invalidInputParameter* – This will have the invalid input parameter name when the return code is 1 or 2.
- *switchNames* – The list of switch names separated by the special character "|".

Operation: Identify Critical Switches for Host

This operation identifies the critical switches for host. A critical switch is a switch that causes loss of connectivity between the host and a storage device when it is removed.

Inputs

- *seCMSIP* – The Storage Essentials (SE) Central Management Server (CMS) IP address.
- *seUser* – The CMS username.
- *se password* – The CMS password.
- *hostName* – The host name.

Responses

- *no risk* – The operation is successful with the response **no risk**.
- *risk* – The operation is successful with the response **risk**.
- *failure* – The operation failed.

Results

- *status* – The actual status message, which describes the success or failure of the operation. In case of failure, this will have the actual error message as described in the Error Codes section.
- *errorCode* – The integer value that describes the actual error code. An error detail for each *errorCode* is given in the Error Codes section.
- *invalidInputParameter* – This will have the invalid input parameter name when the return code is 1 or 2.
- *switchNames* – The list of switch names separated by the special character "|".

Operation: Identify if Application is Clustered

This operation identifies if an application is configured in clustered mode.

Inputs

- *seCMSIP* – The Storage Essentials (SE) Central Management Server (CMS) IP address.

- `seUser` – The CMS username.
- `sePassword` – The CMS password.
- `applicationName` – The application name.
- `hostName` – The host name.

Responses

- *yes* – The operation is successful with the response **yes**.
- *no* – The operation is successful with the response **no**.
- *failure* – The operation failed.

Results

- *status* – The actual status message, which describes the success or failure of the operation. In case of failure, this will have the actual error message as described in the Error Codes section.
- *errorCode* – The integer value that describes the actual error code. An error detail for each *errorCode* is given in the Error Codes section.
- *invalidInputParameter* – This will have the invalid input parameter name when the return code is 1 or 2.
- *hostNames* – The list of host names (clustered node) separated by the special character “|”.

Note: This operation does not support the VM Cluster.

Operation: Identify if Host Clustered

This operation identifies whether a specified host is part of a cluster or not.

Inputs

- `seCMSIP` – The Storage Essentials (SE) Central Management Server (CMS) IP address.
- `seUser` – The CMS username.
- `sePassword` – The CMS password.
- `hostName` – The host name.

Responses

- *yes* – The operation is successful with the response **yes**.
- *no* – The operation is successful with the response **no**.
- *failure* – The operation failed.

Results

- *status* – The actual status message, which describes the success or failure of the operation. In case of failure, this will have the actual error message as described in the Error Codes section.
- *errorCode* – The integer value that describes the actual error code. An error detail for each *errorCode* is given in the Error Codes section.
- *invalidInputParameter* – This will have the invalid input parameter name when the return code is 1 or 2.

- *hostNames* – The list of host names (clustered node) separated by the special character “|”.

Note: This operation does not support the VM Cluster.

Operation: Identify Performance Bottle Necks for Application

This operation identifies all ports that have a port speed less than that of the port with the maximum speed in the application path. The ports could be host HBA ports, switch ports, or storage device ports.

Inputs

- *seCMSIP* – The Storage Essentials (SE) Central Management Server (CMS) IP address.
- *seUser* – The CMS username.
- *sePassword* – The CMS password.
- *applicationName* – The application name.
- *hostName* – The host name.

Responses

- *success* – The operation is successful.
- *failure* – The operation failed.

Results

- *status* – The actual status message, which describes the success or failure of the operation. In case of failure, this will have the actual error message as described in the Error Codes section.
- *errorCode* – The integer value that describes the actual error code. An error detail for each *errorCode* is given in the Error Codes section.
- *invalidInputParameter* – This will have the invalid input parameter name when the return code is 1 or 2.
- *WWNs* – The list of port WWNs separated by the special character “|”.
- *names* – The list of port names separated by the special character “|”.

Operation: Identify Slowest Ports in Application Path

This operation identifies the ports with the slowest speed in an application storage path. The ports can be host HBA ports, switch ports, or storage device ports.

Inputs

- *seCMSIP* – The Storage Essentials (SE) Central Management Server (CMS) IP address.
- *seUser* – The CMS username.
- *sePassword* – The CMS password.
- *applicationName* – The application name.
- *hostName* – The host name.

Responses

- *success* – The operation was successful.
- *failure* – The operation failed.

Results

- *status* – The actual status message, which describes the success or failure of the operation. In case of failure, this will have the actual error message as described in the Error Codes section.
- *errorCode* – The integer value that describes the actual error code. An error detail for each *errorCode* is given in the Error Codes section.
- *invalidInputParameter* – This will have the invalid input parameter name when the return code is 1 or 2.
- *WWNs* – The list of port WWNs separated by the special character “|”.
- *names* – The list of port names separated by the special character “|”.

Operation: List Storage Paths for Application

This operation lists all storage paths for an application.

Inputs

- *seCMSIP* – The Storage Essentials (SE) Central Management Server (CMS) IP address.
- *seUser* – The CMS username.
- *sePassword* – The CMS password.
- *applicationName* – The application name.
- *hostName* – The host name.

Responses

- *success* – The operation was successful.
- *failure* – The operation failed.

Results

- *status* – The actual status message, which describes the success or failure of the operation. In case of failure, this will have the actual error message as described in the Error Codes section.
- *errorCode* – The integer value that describes the actual error code. An error detail for each *errorCode* is given in the Error Codes section.
- *invalidInputParameter* – This will have the invalid input parameter name when the return code is 1 or 2.
- *PATHs* – The list of paths separated by the special character “|”.

Operation: List Storage Paths for Host

This operation lists all paths connecting a host to a storage device.

Inputs

- seCMSIP – The Storage Essentials (SE) Central Management Server (CMS) IP address.
- seUser – The CMS username.
- sePassword – The CMS password.
- hostName – The host name.

Responses

- *success* – The operation was successful.
- *failure* – The operation failed.

Results

- *status* – The actual status message, which describes the success or failure of the operation. In case of failure, this will have the actual error message as described in the Error Codes section.
- *errorCode* – The integer value that describes the actual error code. An error detail for each *errorCode* is given in the Error Codes section.
- *invalidInputParameter* – This will have the invalid input parameter name when the return code is 1 or 2.
- *PATHs* – The list of paths separated by the special character "|".

Operation: Show Impact of Device

This operation lists the set of devices that are connected to a specified device in a SAN. A device can be a host, switch, or storage device.

Inputs

- seCMSIP – The Storage Essentials (SE) Central Management Server (CMS) IP address.
- seUser – The CMS username.
- sePassword – The CMS password.
- name – The element name.
- elementType – This can have any one the following values from the selection list **SE-ElementType**:
 - hsg (host security group)
 - ss (storage system)
 - host (host)
 - switch (switch)

Responses

- *success* – The operation was successful.
- *failure* – The operation failed.

Results

- *status* – The actual status message, which describes the success or failure of the operation. In case of failure, this will have the actual error message as described in the Error Codes section.
- *errorCode* – The integer value that describes the actual error code. An error detail for each *errorCode* is given in the Error Codes section.
- *invalidInputParameter* – This will have the invalid input parameter name when the return code is 1 or 2.
- *hostNames* – The list of host names separated by the special character "|".
- *switchNames* – The list of switch names separated by the special character "|".
- *storageSystemNames* – The list of storage system names separated by the special character "|".

Operation: Add Access to HBA Port

This operation adds the HBA port WWN to the existing host security group (HSG) on the given storage system.

Inputs

- *seCMSIP* – The Storage Essentials (SE) Central Management Server (CMS) IP address.
- *seUser* – The CMS username.
- *sePassword* – The CMS password.
- *storageSystemName* – The storage system name.
- *hostName* – (Optional) The host name.
- *hbaPortWWN* – The HBA port WWN.
- *hsgName* – The host security group name.
- *ssPortWWNs* – (Optional) The list of the storage system's controller port WWNs separated by the special character "|".

Responses

- *success* – The operation was successful.
- *failure* – The operation failed.

Results

- *status* – The actual status message, which describes the success or failure of the operation. In case of failure, this will have the actual error message as described in the Error Codes section.
- *errorCode* – The integer value that describes the actual error code. An error detail for each *errorCode* is given in the Error Codes section.
- *invalidInputParameter* – This will have the invalid input parameter name when the return code is 1 or 2.
- *accessAddedHSGs* – The HSG, HBA Port WWNs, Storage Port WWNs, and storage volumes mapping.
- *notAccessAddedHSGs* – The HSG, HBA Port WWNs, Storage Port WWNs, and storage volumes mapping.

Notes:

- If an HSG already exists with the given HBA port WWN, then WARNING will be given in the output parameter status.
- If the host name is given in the parameter **hostName**, then the HBA port given in the parameter **hbaPortWWN** should be part of that host and that host should be a managed one.

Operation: Create Host Security Group

This operation creates the host security group on a given storage system with initiator ports, target ports, and storage volume collections.

Inputs

- **seCMSIP** – The Storage Essentials (SE) Central Management Server (CMS) IP address.
- **seUser** – The CMS username.
- **sePassword** – The CMS password.
- **hostName** – The host name.
- **hbaPortWWNs** – The list of HBA port WWNs separated by the special character "|".
- **storageSystemName** – The storage system name.
- **ssPortWWNs** – (Optional) The list of the storage system's controller port WWNs separated by the special character "|".
- **storageVolumeNames** – (Optional) The list of storage volume names separated by the special character "|".

Responses

- *success* – The operation was successful.
- *failure* – The operation failed.

Results

- *status* – The actual status message, which describes the success or failure of the operation. In case of failure, this will have the actual error message as described in the Error Codes section.
- *errorCode* – The integer value that describes the actual error code. An error detail for each *errorCode* is given in the Error Codes section.
- *invalidInputParameter* – This will have the invalid input parameter name when the return code is 1 or 2.
- *createdHSGNames* – The list of newly created HSG name separated by the special character "|".
- *existingHSGNames* – The list of already existing HSG names separated by the special character "|".
- *hsgAndHbaPortWWNsMapping* – The HSG And HBA port WWNs mapping.
- *createdHSGs* – The HSG, HBA port WWNs, storage port WWNs, and storage volumes mapping.
- *existingHSGs* – The HSG, HBA port WWNs, storage port WWNs, and storage volumes mapping.

Notes:

- If storage system port(s) are not given as input:

- If an HSG already exists with any storage system port and the given HBA port(s), the flow will not create the HSG for these port(s), map the given storage volume to the existing HSG(s), and return the existing HSG(s) names and mappings.
- If the HSG does not exist, the flow will create the new HSG with all managed/connected storage ports for HP XP, HDS, and EMC Symmetrix, and it will return the created HSG names and mappings.
- If storage system port(s) are given as input:
 - If an HSG already exists with the given storage system ports and given HBA port(s), the flow will not create the HSG for these port(s), map the given storage volume to existing HSG(s), and return existing HSG(s) names and mappings.
 - If an HSG doesn't exist, the flow will create the new HSG with all managed/connected storage ports for HP XP, HDS, and EMC Symmetrix), and return the created HSG names and mappings.
- The output parameters **createdHSGs** and **existingHSGs** will display pipe-separated mapping for created or existing HSG(s), such as "hostname, (hbaPortWWNs), (ssPortWWNs), and (storageVolumeNames)".
- Example of **createdHSGs**:
`hsgName, (h1, h2), (s1, s2), (sv1, sv2) | hsgName, (h2), (s3), (sv2, sv3, sv4) |`
 where `h1, h2, h3` are HBA Port WWNs, `s1, s2, s3` are storage system ports WWNs, and `sv1, sv2` are storage volume names.

Operation: Delete Host Security Group

This operation deletes the host security group from the storage system.

Inputs

- `seCMSIP` – The Storage Essentials (SE) Central Management Server (CMS) IP address.
- `seUser` – The CMS username.
- `sePassword` – The CMS password.
- `storageSystemName` – The storage system name.
- `hsgName` – The host security group name.
- `hbaPortWWNs` – (Optional) The list of HBA port WWNs separated by the special character "|".
- `ssPortWWNs` – (Optional) The list of the storage system's controller port WWNs separated by the special character "|".

Responses

- *success* – The operation was successful.
- *failure* – The operation failed.

Results

- *status* – The actual status message, which describes the success or failure of the operation. In case of failure, this will have the actual error message as described in the Error Codes section.
- *errorCode* – The integer value that describes the actual error code. An error detail for each *errorCode* is given in the Error Codes section.

- *invalidInputParameter* – This will have the invalid input parameter name when the return code is 1 or 2.
- *deletedHSGs* – The HSG, HBA port WWNs, storage port WWNs, and storage volumes mapping.
- *notDeletedHSGs* – The HSG, HBA port WWNs, storage port WWNs, and storage volumes mapping.

Notes:

- If no HSG exists with the given name, then WARNING will be given in the output parameter status and these operations won't fail.
- If HBA Ports and storage system ports are not specified, the flow will delete all the HSGs with the given name.

Operation: Get All Host Security Groups

This operation collects the host security group (HSG) on the given storage system.

Inputs

- *seCMSIP* – The Storage Essentials (SE) Central Management Server (CMS) IP address.
- *seUser* – The CMS username.
- *sePassword* – The CMS password.
- *storageSystemName* – The storage system name.
- *storageVolumeName* – (Optional) The storage volume name.
- *hbaPortWWN* – (Optional) The HBA port WWN.

Responses

- *success* – The operation was successful.
- *failure* – The operation failed.

Results

- *status* – The actual status message, which describes the success or failure of the operation. In case of failure, this will have the actual error message as described in the Error Codes section.
- *errorCode* – The integer value that describes the actual error code. An error detail for each *errorCode* is given in the Error Codes section.
- *invalidInputParameter* – This will have the invalid input parameter name when the return code is 1 or 2.
- *hsgNames* – The list of host security group names separated by the special character "|".
- *hbaPortWWNs* – The list of HBA port WWNs separated by the special character "|".
- *ssPortWWNs* – The list of the storage system's controller port WWNs separated by the special character "|".
- *hsgAndPortWWNsMapping* – HSG, HBA port, and storage port WWNs mapping.

Operation: Get Host Security Group

This operation gets the host security group from the storage system.

Inputs

- seCMSIP – The Storage Essentials (SE) Central Management Server (CMS) IP address.
- seUser – The CMS username.
- sePassword – The CMS password.
- storageSystemName – The storage system name.
- hsgName – The host security group name.
- hbaPortWWNs – (Optional) The list of HBA port WWNs separated by the special character "|".
- ssPortWWNs – (Optional) The list of storage system's controller port WWNs separated by the special character "|".

Responses

- *success* – The operation was *successful*.
- *failure* – The operation failed.

Results

- *status* – The actual status message, which describes the *success* or *failure* of the operation. In case of *failure*, this will have the actual error message as described in the Error Codes section.
- *errorCode* – The integer value that describes the actual error code. An error detail for each *errorCode* is given in the Error Codes section.
- *invalidInputParameter* – This will have the invalid input parameter name when the return code is 1 or 2.
- *hbaPortWWNs* – The list of HBA port WWNs separated by the special character "|".
- *ssPortWWNs* – The list of storage system's controller port WWNs separated by the special character "|".
- *storageVolumeNames* – The list of storage volume names separated by the special character "|".
- *hostMode* – This can have any one the following values from the selection list **SE–HSGhostMode**:
 - windows (windows)
 - IBM aix (AIX)
 - hpux (HPUX)
 - solaris (Solaris)
 - openvms (OpenVMS)
 - linux (Linux), tru64 (Tru64)
 - netware (Netware)
 - trespass (TRESPASS – used in Hitachi arrays), wolfpack (Wolfpack – used in Hitachi arrays), unknown (Unknown)
- *hsgPortsWWNsAndVolumesMapping* – HSG, HBA Port WWNs, Storage Port WWNs, and storage volumes mapping.

Notes:

- The output parameter **hostMode** will have the correct value only for the hp MSA arrays.
- It will give details of all HSGs with same name if HBA ports and storage system ports are not specified.
- It will give details of specific HSGs according to HBA ports and/or storage system ports given.

Operation: Map Storage Volume

This operation adds the storage volume in to the existing host security group (HSG) on the given storage system.

Inputs

- seCMSIP – The Storage Essentials (SE) Central Management Server(CMS) IP address.
- seUser – The CMS username.
- sePassword – The CMS password.
- storageSystemName – The storage system name.
- storageVolumeName – The storage volume name.
- unitNumber – (Optional) The storage volume unit number.
- hsgName – The host security group name.
- hbaPortWWNs – (Optional) The list of HBA port WWNs separated by the special character “,”.
- ssPortWWNs – (Optional) The list of the storage system’s controller port WWNs separated by the special character “,”.

Responses

- *success* – The operation was *successful*.
- *failure* – The operation failed.

Results

- status – The actual status message, which describes the *success* or *failure* of the operation. In case of *failure*, this will have the actual error message as described in the Error Codes section.
- *errorCode* – The integer value that describes the actual error code. An error detail for each *errorCode* is given in the Error Codes section.
- *invalidInputParameter* – This will have the invalid input parameter name when the return code is 1 or 2.
- mappedHSGs – The HSG, HBA port WWNs, storage port WWNs, and storage volumes mapping.
- notMappedHSGs – The HSG, HBA port WWNs, storage port WWNs, and storage volumes mapping.

Notes:

- The flow will add a storage volume to all the HSGs with the given name if HBA ports and storage system ports are not specified.
- If no HSG exists with the given storage volume, WARNING will be given in the output parameter status and this operation won’t fail.
- The **unitNumber** input is valid only for HP XP arrays.

Operation: Remove Access to HBA Port

This operation removes the HBA port WWN from the existing host security group (HSG) on the given storage system.

Inputs

- seCMSIP – The Storage Essentials (SE) Central Management Server(CMS) IP address.
- seUser – The CMS username.
- sePassword – The CMS password.
- storageSystemName – The storage system name.
- hostName – (Optional) The host name.
- hbaPortWWN – The HBA port WWN.
- hsgName – The host security group name.
- ssPortWWNs – (Optional) The list of the storage system’s controller port WWNs separated by a special character.

Responses

- *success* – The operation was *successful*.
- *failure* – The operation failed.

Results

- *status* – The actual status message, which describes the *success* or *failure* of the operation. In case of *failure*, this will have the actual error message as described in the Error Codes section.
- *errorCode* – The integer value that describes the actual error code. An error detail for each *errorCode* is given in the Error Codes section.
- *invalidInputParameter* – This will have the invalid input parameter name when the return code is 1 or 2.
- *accessAddedHSGs* – The HSG, HBA port WWNs, storage port WWNs, and storage volumes mapping.
- *notAccessAddedHSGs* – The HSG, HBA port WWNs, storage port WWNs, and storage volumes mapping.
- *accessRemovedHSGs* – The HSG, HBA port WWNs, storage port WWNs, and storage volumes mapping.
- *notAccessRemovedHSGs* – The HSG, HBA port WWNs, storage port WWNs, and storage volumes mapping.

Notes:

- If an HSG already exists with the given HBA port WWN, then WARNING will be given in the output parameter status.
- If the host name is given in the parameter **hostName**, then the HBA port given in the parameter **hbaPortWWN** should be part of that host and that host should be managed one.
- If no HSG exists with the given HBA port WWN, then WARNING will be given in the output parameter status and this operation won’t fail.

Operation: Set Name

This operation sets the name for the host security group.

Inputs

- seCMSIP – The Storage Essentials (SE) Central Management Server(CMS) IP address.

- seUser – The CMS username.
- sePassword – The CMS password.
- hsgName – The host security group name.
- newName – The element's new name.
- storageSystemName – The storage system name.
- hbaPortWWNs – (Optional) The list of HBA port WWNs separated by the special character ",".
- ssPortWWNs – (Optional) The list of the storage system's controller port WWNs separated by the special character ",".

Responses

- *success* – The operation was *successful*.
- *failure* – The operation failed.

Results

- *status* – The actual status message, which describes the *success* or *failure* of the operation. In case of *failure*, this will have the actual error message as described in the Error Codes section.
- *errorCode* – The integer value that describes the actual error code. An error detail for each *errorCode* is given in the Error Codes section.
- *invalidInputParameter* – This will have the invalid input parameter name when the return code is 1 or 2.
- *newName* – The element's new name.

Notes:

- The HSG name will be set to the given name only if the storage system allows. Storage systems such as MSA and IBM arrays don't allow the flow to set the HSG name.
- If an HSG already exists with the given name, the new name will be assigned in the form of oo___. Also, the new name will be reported in the output parameter **newName**.

Operation: Unmap Storage Volume

This operation removes the storage volume in to the existing host security group (HSG) on the given storage system.

Inputs

- seCMSIP – The Storage Essentials (SE) Central Management Server(CMS) IP address.
- seUser – The CMS username.
- sePassword – The CMS password.
- storageSystemName – The storage system name.
- storageVolumeName – The storage volume name.
- hsgName – The host security group name.
- hbaPortWWNs – (Optional) The list of HBA port WWNs separated by the special character ",".
- ssPortWWNs – (Optional) The list of the storage system's controller port WWNs separated by the special character ",".

Responses

- *success* – The operation was *successful*.
- *failure* – The operation failed.

Results

- *status* – The actual status message, which describes the *success* or *failure* of the operation. In case of *failure*, this will have the actual error message as described in the Error Codes section.
- *errorCode* – The integer value that describes the actual error code. An error detail for each *errorCode* is given in the Error Codes section.
- *invalidInputParameter* – This will have the invalid input parameter name when the return code is 1 or 2.
- *mappedHSGs* – The HSG, HBA port WWNs, storage port WWNs, and storage volumes mapping.
- *notMappedHSGs* – The HSG, HBA port WWNs, storage port WWNs, and storage volumes mapping.
- *unmappedHSGs* – The HSG, HBA port WWNs, storage port WWNs, and storage volumes mapping.
- *notUnmappedHSGs* – The HSG, HBA port WWNs, storage port WWNs, and storage volumes mapping.

Notes:

- This operation will add storage volume to all of the HSGs with the given name if the HBA ports and storage system ports are not specified.
- If no HSG exists with the given storage volume, then WARNING will be given in the output parameter status and this operation will not fail.
- The **unitNumber** input is valid only for HP XP arrays.
- If no HSG exists with the given storage volume, then WARNING will be given in the output parameter status and this operation will not fail.
- This operation will remove the storage volume from all of the HSGs with the given name if the HBA ports and storage system ports are not specified.

Operation: Delete Storage Pool

This operation deletes the storage pool on the given storage system.

Inputs

- *seCMSIP* – The Storage Essentials (SE) Central Management Server(CMS) IP address.
- *seUser* – The CMS username.
- *sePassword* – The CMS password.
- *storageSystemName* – The storage system name.
- *storagePoolName* – The storage pool name.

Responses

- *success* – The operation was *successful*.
- *failure* – The operation failed.

Results

- *status* – The actual status message, which describes the *success* or *failure* of the operation. In case of *failure*, this will have the actual error message as described in the Error Codes section.
- *errorCode* – The integer value that describes the actual error code. An error detail for each *errorCode* is given in the Error Codes section.
- *invalidInputParameter* – This will have the invalid input parameter name when the return code is 1 or 2.

Operation: Get All Storage Pools

This operation collects the list of storage pools from the given storage system.

Inputs

- *seCMSIP* – The Storage Essentials (SE) Central Management Server(CMS) IP address.
- *seUser* – The CMS username.
- *sePassword* – The CMS password.
- *storageSystemName* – The storage system name.

Responses

- *success* – The operation was *successful*.
- *failure* – The operation failed.

Results

- *status* – The actual status message, which describes the *success* or *failure* of the operation. In case of *failure*, this will have the actual error message as described in the Error Codes section.
- *errorCode* – The integer value that describes the actual error code. An error detail for each *errorCode* is given in the Error Codes section.
- *invalidInputParameter* – This will have the invalid input parameter name when the return code is 1 or 2
- *storagePoolNames* – The list of storage pool name separated by the special character "|".

Operation: Get Storage Pool

This operation collects the detailed information of a storage pool from the given storage system.

Inputs

- *seCMSIP* – The Storage Essentials (SE) Central Management Server(CMS) IP address.
- *seUser* – The CMS username.
- *sePassword* – The CMS password.
- *storageSystemName* – The storage system name.
- *storagePoolName* – The storage pool name.

Responses

- *success* – The operation was *successful*.
- *failure* – The operation failed.

Results

- *status* – The actual status message, which describes the *success* or *failure* of the operation. In case of *failure*, this will have the actual error message as described in the Error Codes section.
- *errorCode* – The integer value that describes the actual error code. An error detail for each *errorCode* is given in the Error Codes section.
- *invalidInputParameter* – This will have the invalid input parameter name when the return code is 1 or 2.
- *size* – The size of the storage volume.
- *freysize* – The available size in volume.
- *raidType* – This can have one of the values from the **SE-RAIDtype** selection list:
 - Non-Redundant Striped Storage
 - Redundant Parity Based Storage
 - Redundant Mirrored Storage
- *storageVolumeNames* – The list of storage volume names separated by the special character “|”.
- *discoveryStatus* – The discovery status of the SE element.

Operation: Create Storage Volume

This operation creates the storage volume on the given storage system.

Inputs

- *seCMSIP* – The Storage Essentials (SE) Central Management Server(CMS) IP address.
- *seUser* – The CMS username.
- *sePassword* – The CMS password.
- *storageSystemName* – The storage system name.
- *size* – The size of the storage volume.
- *storageVolumeName* – (Optional) The storage volume name.
- *raidType* – This can have one of the values from the **SE-RAIDtype** selection list:
 - Non-Redundant Striped Storage
 - Redundant Parity Based Storage
 - Redundant Mirrored Storage
- *storagePoolName* – (Optional) The storage pool name.

Responses

- *success* – The operation was *successful*.
- *failure* – The operation failed.

Results

- *status* – The actual status message, which describes the *success* or *failure* of the operation. In case of *failure*, this will have the actual error message as described in the Error Codes section.
- *errorCode* – The integer value that describes the actual error code. An error detail for each *errorCode* is given in the Error Codes section.
- *invalidInputParameter* – This will have the invalid input parameter name when the return code is 1 or 2.
- *newStorageVolumeName* – The new storage volume name.

Operation: Delete Storage Volume

This operation deletes the storage volume on the given storage system.

Inputs

- *seCMSIP* – The Storage Essentials (SE) Central Management Server(CMS) IP address.
- *seUser* – The CMS username.
- *sePassword* – The CMS password.
- *storageSystemName* – The storage system name.
- *storageVolumeName* – The storage volume name.

Responses

- *success* – The operation was *successful*.
- *failure* – The operation failed.

Results

- *status* – The actual status message, which describes the *success* or *failure* of the operation. In case of *failure*, this will have the actual error message as described in the Error Codes section.
- *errorCode* – The integer value that describes the actual error code. An error detail for each *errorCode* is given in the Error Codes section.
- *invalidInputParameter* – This will have the invalid input parameter name when the return code is 1 or 2.

Operation: Get All Storage Volumes

This operation collects the list of storage volume names from the given storage system.

Inputs

- *seCMSIP* – The Storage Essentials (SE) Central Management Server(CMS) IP address.
- *seUser* – The CMS username.
- *sePassword* – The CMS password.
- *storageSystemName* – The storage system name.
- *onlyManaged* – (Optional) Whether to consider only the managed element or not.

- StorageVolumeVisibility – (Optional) This can have one of the values from the **SE–StorageVolumeVisibility** selection list:
 - mapped – Mapped storage volumes
 - unmapped – Unmapped storage volumes
 - all – All storage volumes

Responses

- *success* – The operation was *successful*.
- *failure* – The operation failed.

Results

- *status* – The actual status message, which describes the *success* or *failure* of the operation. In case of *failure*, this will have the actual error message as described in the Error Codes section.
- *errorCode* – The integer value that describes the actual error code. An error detail for each *errorCode* is given in the Error Codes section.
- *invalidInputParameter* – This will have the invalid input parameter name when the return code is 1 or 2.
- *storageVolumeNames* – The list of storage volume names separated by the special character “|”.

Operation: Get Mapped HBA Ports For Storage Volume

This operation collects the list of HBA ports mapped to a storage volume on the given storage system.

Inputs

- seCMSIP – The Storage Essentials (SE) Central Management Server(CMS) IP address.
- seUser – The CMS username.
- sePassword – The CMS password.
- storageSystemName – The storage system name.
- storageVolumeName – The storage volume name.

Responses

- *success* – The operation was *successful*.
- *failure* – The operation failed.

Results

- *status* – The actual status message, which describes the *success* or *failure* of the operation. In case of *failure*, this will have the actual error message as described in the Error Codes section.
- *errorCode* – The integer value that describes the actual error code. An error detail for each *errorCode* is given in the Error Codes section.
- *invalidInputParameter* – This will have the invalid input parameter name when the return code is 1 or 2.
- *hbaPortWWNs* – The list of HBA port WWNs separated by the special character “|”.

Operation: Get Storage Volume

This operation collects the detailed information of storage volume from the given storage system.

Inputs

- seCMSIP – The Storage Essentials (SE) Central Management Server(CMS) IP address.
- seUser – The CMS username.
- sePassword – The CMS password.
- storageSystemName – The storage system name.
- storageVolumeName – The storage volume name.

Responses

- *success* – The operation was *successful*.
- *failure* – The operation failed.

Results

- *status* – The actual status message, which describes the *success* or *failure* of the operation. In case of *failure*, this will have the actual error message as described in the Error Codes section.
- *errorCode* – The integer value that describes the actual error code. An error detail for each *errorCode* is given in the Error Codes section.
- *invalidInputParameter* – This will have the invalid input parameter name when the return code is 1 or 2.
- *size* – The size of the storage volume.
- *freesize* – The available size in the volume.
- *raidType* – This can have one of the values from the **SE-RAIDtype** selection list:
 - non-redundant striped storage
 - redundant parity based storage
 - redundant mirrored storage
- *storagePoolName* – The storage pool name.
- *desc* – The description of the element.
- *discoveryStatus* – The discovery status of the SE element.

Operation: Find Storage Systems in Zone With HBA Port

This operation finds all storage systems in zone with the given HBA ports WWN.

Inputs

- seCMSIP – The Storage Essentials (SE) Central Management Server(CMS) IP address.
- seUser – The CMS username.
- sePassword – The CMS password.
- hostName – The host name.
- hbaPortWWN – The HBA port WWN.

Responses

- *success* – The operation was *successful*.
- *failure* – The operation failed.

Results

- *status* – The actual status message, which describes the *success* or *failure* of the operation. In case of *failure*, this will have the actual error message as described in the Error Codes section.
- *errorCode* – The integer value that describes the actual error code. An error detail for each *errorCode* is given in the Error Codes section.
- *invalidInputParameter* – This will have the invalid input parameter name when the return code is 1 or 2.
- *storageSystemNames* – The list of the storage system names separated by the special character "|".

Operation: Find Storage Systems Not In Zone With HBA Port

This operation finds all storage systems in the zone with the given HBA port's WWN.

Inputs

- *seCMSIP* – The Storage Essentials (SE) Central Management Server(CMS) IP address.
- *seUser* – The CMS username.
- *sePassword* – The CMS password.
- *hostName* – The host name.
- *hbaPortWWN* – The HBA port WWN.

Responses

- *success* – The operation was *successful*.
- *failure* – The operation failed.

Results

status – The actual status message, which describes the *success* or *failure* of the operation. In case of *failure*, this will have the actual error message as described in the Error Codes section.

errorCode – The integer value that describes the actual error code. An error detail for each *errorCode* is given in the Error Codes section.

invalidInputParameter – This will have the invalid input parameter name when the return code is 1 or 2.

storageSystemNames – The list of the storage system names separated by the special character "|".

Operation: Find Suitable Storage From List

This operation finds all storage systems that match the specified redundancy and size.

Inputs

- seCMSIP – The Storage Essentials (SE) Central Management Server(CMS) IP address.
- seUser – The CMS username.
- sePassword – The CMS password.
- storageSystemNames – List of The storage system name. separated by special character “,”.
- raidType – This can have a value from the **SE-RAIDtype** selection list:
 - non-redundant striped storage
 - redundant parity based storage
 - redundant mirrored storage
- size – The size of the storage volume.

Responses

- *success* – The operation was *successful*.
- *failure* – The operation failed.

Results

- *status* – The actual status message, which describes the *success* or *failure* of the operation. In case of *failure*, this will have the actual error message as described in the Error Codes section.
- *errorCode* – The integer value that describes the actual error code. An error detail for each *errorCode* is given in the Error Codes section.
- *invalidInputParameter* – This will have the invalid input parameter name when the return code is 1 or 2.
- *storageSystemNames* – The list of the storage system names separated by the special character “|”.

Operation: Get All FC Ports

This operation gets all of the FC Ports in the storage system.

Inputs

- seCMSIP – The Storage Essentials (SE) Central Management Server(CMS) IP address.
- seUser – The CMS username.
- sePassword – The CMS password.
- storageSystemName – The storage system name.

Responses

- *success* – The operation was *successful*.
- *failure* – The operation failed.

Results

- *status* – The actual status message, which describes the *success* or *failure* of the operation. In case of *failure*, this will have the actual error message as described in the Error Codes section.

- *errorCode* – The integer value that describes the actual error code. An error detail for each *errorCode* is given in the Error Codes section.
- *invalidInputParameter* – This will have the invalid input parameter name when the return code is 1 or 2.
- *ssPortWWNs* – The list of the storage system’s controller port WWNs separated by the special character “|”.

Operation: Get All Storage System

This operation collects the list storage systems from the given fabric.

Inputs

- *seCMSIP* – The Storage Essentials (SE) Central Management Server(CMS) IP address.
- *seUser* – The CMS username.
- *sePassword* – The CMS password.
- *fabricName* – (Optional) fabric Name
- *onlyManaged* – (Optional) Whether or not to consider only the managed elements.

Responses

- *success* – The operation was *successful*.
- *failure* – The operation failed.

Results

- *status* – The actual status message, which describes the *success* or *failure* of the operation. In case of *failure*, this will have the actual error message as described in the Error Codes section.
- *errorCode* – The integer value that describes the actual error code. An error detail for each *errorCode* is given in the Error Codes section.
- *invalidInputParameter* – This will have the invalid input parameter name when the return code is 1 or 2.
- *storageSystemNames* – The list of the storage system names separated by the special character “|”.

Operation: Get Storage System

This operation collects detailed information about the storage system.

Inputs

- *seCMSIP* – The Storage Essentials (SE) Central Management Server (CMS) IP address.
- *seUser* – The CMS username.
- *sePassword* – The CMS password.
- *storageSystemName* – The storage system name.
- *fabricName* – (Optional) The fabric name.

Responses

- success – The operation was successful.
- failure – The operation failed.

Results

- *status* – The actual status message, which describes the *success* or *failure* of the operation. In case of *failure*, this will have the actual error message as described in the Error Codes section.
- *errorCode* – The integer value that describes the actual error code. An error detail for each *errorCode* is given in the Error Codes section.
- *invalidInputParameter* – This will have the invalid input parameter name when the return code is 1 or 2.
- *serialNumber* – The serial number.
- *firmwareVersion* – The firmware version.
- *managementURL* – The management application URL.
- *model* – The model name.
- *vendor* – The vendor name.
- *desc* – The description of the element.
- *discoveryStatus* – The discovery status of the SE element.
- *ssPortWWNs* – The list of the storage system's controller port WWNs separated by the special character "|".
- *storageVolumeNames* – The list of the storage volume names separated by the special character "|".
- *storagePoolNames* – The list of storage pool names separated by the special character "|".
- *hsgNames* – The list of host security group names separated by the special character "|".

Operation: Get All Hosts

This flow collects the list hosts from the given fabric.

Inputs

- *seCMSIP* – The Storage Essentials (SE) Central Management Server (CMS) IP address.
- *seUser* – The CMS username.
- *sePassword* – The CMS password.
- *fabricName* – (Optional) The fabric name.
- *onlyManaged* – (Optional) Whether or not to consider only the managed elements.

Responses

- *success* – The operation was *successful*.
- *failure* – The operation failed.

Results

- *status* – The actual status message, which describes the *success* or *failure* of the operation. In case of *failure*, this will have the actual error message as described in the Error Codes section.
- *errorCode* – The integer value that describes the actual error code. An error detail for each *errorCode* is given in the Error Codes section.
- *invalidInputParameter* – This will have the invalid input parameter name when the return code is 1 or 2.
- *hostNames* – The list of host names separated by the special character “|”.

Operation: Get All Paths

This operation gets all of the paths that contain the specified storage array and storage volume for a specified host.

Inputs

- *seCMSIP* – The Storage Essentials (SE) Central Management Server (CMS) IP address.
- *seUser* – The CMS username.
- *sePassword* – The CMS password.
- *hostName* – (Optional) The host name.
- *storageSystemName* – (Optional) The storage system name.
- *storageVolumeName* – (Optional) The storage volume name.

Responses

- *success* – The operation was *successful*.
- *failure* – The operation failed.

Results

- *status* – The actual status message, which describes the *success* or *failure* of the operation. In case of *failure*, this will have the actual error message as described in the Error Codes section.
- *errorCode* – The integer value that describes the actual error code. An error detail for each *errorCode* is given in the Error Codes section.
- *invalidInputParameter* – This will have the invalid input parameter name when the return code is 1 or 2.
- *paths* – The list of all of the storage volumes separated by the special character “|”.
- *diskName* – The name of the disk created on the host.

Operation: Get Host

This operation collects detailed information about the host.

Inputs

- *seCMSIP* – The Storage Essentials (SE) Central Management Server (CMS) IP address.

- seUser – The CMS username.
- sePassword – The CMS password.
- hostName – The host name.
- fabricName – (Optional) The fabric name.

Responses

- *success* – The operation was *successful*.
- *failure* – The operation failed.

Results

- *status* – The actual status message, which describes the *success* or *failure* of the operation. In case of *failure*, this will have the actual error message as described in the Error Codes section.
- *errorCode* – The integer value that describes the actual error code. An error detail for each *errorCode* is given in the Error Codes section.
- *invalidInputParameter* – This will have the invalid input parameter name when the return code is 1 or 2.
- *ipAddress* – The IP address.
- *dnsName* – The DNS name.
- *serialNumber* – The serial number.
- *osVersion* – The operating system version.
- *ramSize* – The RAM size in MB.
- *model* – The model name.
- *vendor* – The vendor name.
- *numberOfProcessors* – The number of processors.
- *hbaPortWWNs* – The list of HBA port WWNs separated by special character “,”.
- *Desc* – The description of the element.
- *discoveryStatus* – The discovery status of the SE element.

Operation: List of Ports In Same Fabric

This operation gets a list of the FC ports in the same fabric on the specified host.

Inputs

- seCMSIP – The Storage Essentials (SE) Central Management Server (CMS) IP address.
- seUser – The CMS username.
- sePassword – The CMS password.
- hostName – The host name.
- storageSystemName – The storage system name.

Responses

- *success* – The operation was *successful*.
- *failure* – The operation failed.

Results

- *status* – The actual status message, which describes the *success* or *failure* of the operation. In case of *failure*, this will have the actual error message as described in the Error Codes section.
- *errorCode* – The integer value that describes the actual error code. An error detail for each *errorCode* is given in the Error Codes section.
- *invalidInputParameter* – This will have the invalid input parameter name when the return code is 1 or 2.
- *WWNs* – The list of the FC port WWNs in the fabric.

Operation: Add access to HBA Port for a Storage Volume

This operation adds access to an HBA port for a storage volume on the given storage system.

Inputs

- *seCMSIP* – The Storage Essentials (SE) Central Management Server (CMS) IP address.
- *seUser* – The CMS username.
- *sePassword* – The CMS password.
- *storageSystemName* – The storage system name.
- *storageVolumeName* – storage volume Name
- *hostName* – The host name.
- *hbaPortWWN* – The HBA port WWN.
- *unitNumber* – (Optional) The storage volume unit number.

Responses

- *success* – The operation was *successful*.
- *failure* – The operation failed.

Results

- *status* – The actual status message, which describes the *success* or *failure* of the operation. In case of *failure*, this will have the actual error message as described in the Error Codes section.
- *errorCode* – The integer value that describes the actual error code. An error detail for each *errorCode* is given in the Error Codes section.
- *invalidInputParameter* – This will have the invalid input parameter name when the return code is 1 or 2.
- *hsgNames* – The list of host security group names separated by special character",,".

Notes:

- If no HSG exists with the given HBA port and the storage volume, then WARNING will be given in the output parameter status.
- If an HSG already exists with the given HBA port WWN and the storage volume, then this operation will report the WARNING message and will not create a new HSG. The output parameter **hsgNames** will have the existing HSG name.
- The input **unitNumber** is valid only for HP XP arrays.

Operation: Get mapped Storage Volumes for a HBA port

This operation collects a list of the storage volumes mapped to the given HBA port from the given storage system.

Inputs

- seCMSIP – The Storage Essentials (SE) Central Management Server (CMS) IP address.
- seUser – The CMS username.
- sePassword – The CMS password.
- hbaPortWWN – HBA port WWN
- storageSystemName – The storage system name.
- visibilitySV – The mapped or Unmapped storage volumes. This input can have any one the following values from the selection list **SE–StorageVolumeVisibility**:
 - mapped (mapped storage volumes)
 - unmapped (unmapped storage volumes)
 - all (all storage volumes)

Responses

- *success* – The operation was *successful*.
- *failure* – The operation failed.

Results

- *status* – The actual status message, which describes the *success* or *failure* of the operation. In case of *failure*, this will have the actual error message as described in the Error Codes section.
- *errorCode* – The integer value that describes the actual error code. An error detail for each *errorCode* is given in the Error Codes section.
- *invalidInputParameter* – This will have the invalid input parameter name when the return code is 1 or 2.
- *storageVolumeNames* – The list of storage volume names separated by the special character “|”.

Operation: Get Storage Systems connected to HBA port

This operation collects the list of storage systems having HSG with the given HBA port.

Inputs

- seCMSIP– The Storage Essentials (SE) Central Management Server (CMS) IP address.
- seUser– The CMS username.
- sePassword– The CMS password.
- hbaPortWWN– The HBA port WWN.
- fabricName– (Optional) The fabric name.
- visibilitySS– The visibility of the storage systems. This input can have any one the following values from the selection list **SE– VisibilityOptions**:
 - visible (Get the storage systems which are having HSG with the given HBA port)

- nonvisible (Get the storage systems which are not having HSG with the given HBA port)
- all (Get all storage systems in a fabric)

Responses

- *success* – The operation was *successful*.
- *failure* – The operation failed.

Results

- *status* – The actual status message, which describes the *success* or *failure* of the operation. In case of *failure*, this will have the actual error message as described in the Error Codes section.
- *errorCode* – The integer value that describes the actual error code. An error detail for each *errorCode* is given in the Error Codes section.
- *invalidInputParameter* – This will have the invalid input parameter name when the return code is 1 or 2.
- *storageSystemNames* – The list of the storage system names separated by the special character “|”.

Operation: Get Zones for HBA port

This operation gets all zones related to the specified HBA port WWN.

Inputs

- *seCMSIP* – The Storage Essentials (SE) Central Management Server (CMS) IP address.
- *seUser* – The CMS username.
- *sePassword* – The CMS password.
- *hostName* – The host name.
- *hbaPortWWN* – The HBA port WWN.
- *activeStatus* – This input can have a value from the **SE–ActiveStatus** selection list:
 - *active* – Consider only active elements
 - *inactive* – Consider only inactive elements
 - *all* – Consider all elements whether or not active

Responses

- *success* – The operation was *successful*.
- *failure* – The operation failed.

Results

- *status* – The actual status message, which describes the *success* or *failure* of the operation. In case of *failure*, this will have the actual error message as described in the Error Codes section.
- *errorCode* – The integer value that describes the actual error code. An error detail for each *errorCode* is given in the Error Codes section.
- *invalidInputParameter* – This will have the invalid input parameter name when the return code is 1 or 2.

- *zoneNames* – The list of zone names separated by the special character “|”.

Operation: Remove access to HBA port for a Storage Volume

This operation removes access to an HBA port for a storage volume on the given storage system.

Inputs

- *seCMSIP* – The Storage Essentials (SE) Central Management Server (CMS) IP address.
- *seUser* – The CMS username.
- *sePassword* – The CMS password.
- *storageSystemName* – The storage system name.
- *storageVolumeName* – The storage volume name.
- *hostName* – The host name.
- *hbaPortWWN* – The HBA port WWN.

Responses

- *success* – The operation was *successful*.
- *failure* – The operation failed.

Results

- *status* – The actual status message, which describes the *success* or *failure* of the operation. In case of *failure*, this will have the actual error message as described in the Error Codes section.
- *errorCode* – The integer value that describes the actual error code. An error detail for each *errorCode* is given in the Error Codes section.
- *invalidInputParameter* – This will have the invalid input parameter name when the return code is 1 or 2.

Note:

- If no HSG exists with the given HBA port and the storage volume, then WARNING will be given in the output parameter status.

Operation: ASM Disk Stamping

This operation stamps the specified disk drive using the Oracle ASM Tool utility.

Inputs: context value

- *host* – *ICT_host* – The host to Telnet into.
- *port* – *ICT_Port* – The Telnet port to connect to (defaults to 23).
- *session* – *ICT_Session* – A string used by Telnet operations to share the same Telnet session (defaults to *ICT_Session1*).

Responses

- *success* – The operation was *successful*.
- *failure* – The operation failed.

Operation: checkNotBlank

This operation checks whether the input value is blank or not.

Inputs

- *checkValue* – The value for the blank check.

Responses

- *blank* – The value is blank.
- *notblank* – The value is not blank.

Operation: Decision Operation

This is a simple operation that returns either "Yes" or "No" based on the input of the literal (that is, "Yes" or "No" or "True" or "False"). Its uses include prompting a user to select "Yes" or "No" from a selection list (for instance, "Would you like to check the status of another service?").

This operation is deprecated since the operation **Evaluate Expression** can be used instead.

Inputs

- *decisionValue* – The question to ask the user.
- *yesValue* – The value of a yes answer.
- *noValue* – The value of a no answer.

Responses

- *success* – The user selected "Yes".
- *failure* – The user selected "No".

Operation: Incrementor

This operation increments the input value by one.

Inputs

- *key* – The value to be incremented.

Responses

- *success* – The operation *successfully* incremented the value.

- *failure* – The operation failed to increment the value.

Operation: List Merge

This operation checks to see if a list contains every element in another list.

Inputs

- list1 – The first list.
- list2 – The second list.
- delimiter – A delimiter that separates the elements in the two lists.

Responses

- *success* – list1 and list2 have merged *successfully*.
- *failure* – The operation failed to merge the lists.

Results

- All items contained in the container that are not in the sublist. To access this result, you must click the **Advanced** tab in the Inspector and then select the check box **Assign result to flow variable**. The flow variable you enter in the box provided will store the item list and will be accessible from anywhere within the flow.

operation: sizeConverter

This operation converts the size of one unit to the size of another.

Inputs

- size – The size to be converted.
- from – The “from” unit.
- to – The “to” unit.

Responses

- *success* – The conversion was successful.
- *failure* – The conversion failed.

Operation: Validate IP Address

This operation validates an IP address.

Inputs

- IP Address – The IP address that has to be validated.

Responses

- *success* – The IP address is valid.
- *failure* – The IP address is not valid.

Operation: Validate WWN

This is a simple operation that validates a WWN.

Inputs

- WWN – The WWN to be validated.

Responses

- *success* – The WWN is valid.
- *failure* – The WWN is not valid.

Operation: Validate Volume Details for Creation

This operation validates the inputs provided for the creation of a volume on a storage array.

Inputs

- *size* – Checks against non-numeric or negative numeric inputs.
- *name* – Checks against invalid characters in the name. Valid characters for the volume name are: numbers, letters, "-", and "_".

Responses

- *success* – The volume inputs are *successfully* validated.
- *failure* – The input validation failed.

Results

- *status* The operation status message.

Operation: Provision Storage to a Host

This operation attempts to create a volume with the specified characteristics (size, redundancy) and assign it to the host. It tries to select the most suitable storage array to provide the storage using the following criteria:

1. The storage array having the capability to provide the necessary size and redundancy level for the volume.
2. As far as possible, the operation will select a storage array in the same zone as the host port(s), to avoid the creation of zones, unless it is absolutely essential.
3. It creates a volume or meta-volume on the selected array.

4. It creates host security group on the selected device.
5. It creates a zone in the fabric (if the zone doesn't exist for the host and the selected array) to establish connectivity between the host and the storage, on an as-needed basis.
6. It will try to provision other arrays in the host fabric if the provisioning fails on one.

To implement the operation, the target Storage Essentials CMS should be running and the JRAS service should be running on the OO Central server.

Inputs

- Cms – The name or IP address of the Storage Essentials CMS.
- User – The Storage Essentials user.
- The password. – The user's password.
- Server – The name or IP address of the server for which storage needs to be provisioned.
- Name – The name of the volume that will be created on the array. Valid characters for the volume name are: numbers, letters, "-", and "_".
This value will be ignored for HP MSA, XP arrays, HDS, and EMC Symmetrix, as the array will assign the volume name.
- Size – The size of the volume.
- Redundancy – This is the redundancy of the array as required. This can be any of the following values:
 - Non-redundant Striped Volumes (RAID0 on most arrays)
 - Redundant Parity Based Volumes (RAID5 or equivalent)
 - Redundant Mirrored Volumes (RAID1)

Responses

- *Provisioning Failed* – The provisioning operation failed.
- *Provisioning Successful* – The provisioning operation succeeded on first storage array.
- *ProvisionSuccess_RollbackRequired* – The provisioning operation succeeded on one of the storage arrays in the host fabric, but tried to provision on more than one array.
- *Pool not available* – The provisioning failed because there were no storage arrays available to create the required volume.

Results

- *Name* – The name of the volume. In case the array assigns the volume name, this will overwrite the value specified by the user.
- *storagearray* – The name of the array from which the storage was provisioned.
- *zone* – The name of the zone that was created to establish connectivity between the host and the storage, but zone activation failed. In case multiple zones were created, this will be a "|" separated string of the individual zone names.
- *fabric* – The name of the fabric to which the host and storage array belong, and zone activation failed.
- *Volumes* – The name of the volumes that were created on storage arrays but couldn't provision to the host. In case volumes were created on multiple arrays, this will be a "|" separated string of the individual volume names.

- *arraysForVolumeCreated* – The names of the storage arrays in which volumes created but couldn't be provisioned to the host. In case multiple volumes were created on different arrays, this will be a "|" separated string of the individual storage array names.
- *HSGs* – The names of the host security groups which will provide access to the volume that was created but couldn't be provisioned to the host. In case the HSGs were created on multiple arrays, this will be a "|" separated string of the individual HSG names. In case multiple HSGs were created on the same array, this will be a ";" separated string of the individual HSG names.
- *arraysForHSGCreated* – The names of the storage arrays in which HSGs were created but couldn't be used to provision to host.
- *provisionSuccess* – If the operation was able to provision one of the arrays from the host fabric this value would be "YES"; otherwise it would be "NO".

Operation: Get Hosts Managed by Storage Essentials CMS

This operation collects the list of managed hosts from all fabrics in SE.

Inputs

- *seCMSIP* – The Storage Essentials (SE) Central Management Server (CMS) IP address.
- *seUser* – The CMS username.
- *sePassword* – The CMS password.

Responses

- *success* – The operation completed *successfully*.
- *failure* – The operation failed.

Results

- *status* – The operation status message.
- *hostList* – The list of managed hosts in SE.

Operation: Validate SE CMS

This operation connects to Storage Essentials.

Inputs

- *seCMSIP* – The Storage Essentials (SE) Central Management Server (CMS) IP address.
- *seUser* – The CMS username.
- *sePassword* – The CMS password.

Responses

- *success* – The operation completed *successfully*.
- *failure* – The operation failed.

Results

- *status* – The operation status message.

Operation: Change Approval Decision Operation for Storage Provisioning

This is a simple operation that returns "approved" or "denied" based on an input of the literal. Its uses include prompting a user to select "approved" or "denied" from a selection list (for instance, "Would you like to check the status of another service?").

Inputs

- *decisionValue* – The question to ask the user.
- *yesValue* – The value of a yes answer ("approved").
- *noValue* – The value of a no answer ("denied").
- *openTicket* – Whether or not the change ticket is open ("true" or "false").

Responses

- *success* – The user selected "approved".
- *failure* – The user selected "denied".

Operation: Free Provisioned Objects

This operation can be used to delete provisioned objects in a SAN environment. Currently, this flow is designed to integrate with the **Provisioning** flow to rollback already provisioned objects (such as volumes, HSGs, or zones) in case the operation tries to provision on more than one storage array or it fails.

Inputs

- *Cms* – The name or IP address of the Storage Essentials CMS.
- *User* – The Storage Essentials user.
- *The password.* – The user's password.
- *provisionSuccess* – This indicates whether the provisioning was *successful* or not. The values are "YES" and "NO".
- *zone* – The name of the zone that was created to establish connectivity between the host and the storage, but zone activation failed. In case multiple zones were created, this will be a "|" separated string of the individual zone names.
- *fabric* – The name of the fabric to which the host and storage array belong, and zone activation fails.
- *Volumes* – The name of the volumes that were created on storage arrays but couldn't be provisioned to the host. In case multiple volumes are created on different arrays, this will be a "|" separated string of the individual volume names.
- *arraysForVolumeCreated* – The names of the storage arrays in which volumes were created but couldn't be provisioned to the host. In case multiple volumes are created on different arrays, this will be a "|" separated string of the individual storage array names.

- HSGs – The names of the host security groups which will provide access to the volume that was created but couldn't be used to provision to the host.
- `arraysForHSGCreated` – The names of the storage arrays in which HSGs were created but could not be used to provision to the host.

Responses

Responses depend on the value of `provisionSuccess` ("YES" or "NO").

If `provisionSuccess` is "YES":

- `provisionSuccess_RollbackSuccess` – The unused objects provisioned by the flow were successfully deleted when it was able to provision successfully.
- `provisionSuccess_RollbackFailed` – The unused objects provisioned by the flow could not be deleted when it was able to provision successfully. The user may need to manually delete these objects.

If `provisionSuccess` is "NO":

- `provisionFailed_RollbackSuccess` – The unused objects provisioned by the flow were successfully deleted when it couldn't provision successfully.
- `provisionFailed_RollbackFailed` – The unused objects provisioned by the flow could not be deleted when it couldn't provision successfully. The user may need to manually delete these objects.

Operation: Change Approval Decision Operation for Add or Remove HBA

This is a simple operation that returns "approved" or "denied" based on an input of the literal. Its uses include prompting a user to select "approved" or "denied" from a selection list for instance, "Would you like to check the status of another service?").

Inputs

- `decisionValue` – The question to ask the user.
- `yesValue` – The value of a yes answer ("approved").
- `noValue` – The value of a no answer ("denied").
- `openTicket` – Whether or not the change ticket is open ("true" or "false").

Responses

- `success` – The user selected "approved".
- `failure` – The user selected "denied".

Operation: Get storage Volumes for HBA port

This operation collects the list of storage volumes in the storage system from the same fabric where the HBA port WWN is present, based on the **visibility** option of the storage volume to the HBA port.

Inputs

- seCMSIP – The Storage Essentials (SE) Central Management Server (CMS) IP address.
- seUser – The CMS username.
- sePassword – The CMS password.
- storageSystemName – The name of the managed storage system in SE.
- initiatorWWN – The HBA port WWN.
- visibility – This input can be any of the values in the Selection List **SE–VisibilityOptions**:
 - *Visible* Collect the list of storage volumes that are mapped to the **initiatorWWN**.
 - *NonVisible* Collect the list of storage volumes that are not mapped to the **initiatorWWN**.
 - *All* Collect the list of storage volumes from the storage system **storageSystemName**.

Responses

- *success* – The operation completed *successfully*.
- *failure* – The operation failed.

Results

- *status* – The operation status message.
- *svList* – The list of storage volumes in the storage system **storageSystemName**.

Operation: Get Storage Systems connected to HBA port

This operation collects the list of storage systems from the fabric based on the **visibility** of the storage system from the HBA port.

Inputs

- seCMSIP – The Storage Essentials (SE) Central Management Server (CMS) IP address.
- seUser – The CMS username.
- sePassword – The CMS password.
- initiatorWWN – The HBA Port WWN.
- visibility – This input can be any of the values in the selection list **SE–VisibilityOptions**:
 - *Visible* – Collect the list of storage systems with **initiatorWWN** in their HSG.
 - *NonVisible* – Collect the list of storage systems without **initiatorWWN** in their HSG.
 - *All* – Collect the list of storage systems from the same fabric where the **initiatorWWN** is present.

Responses

- *success* – The operation completed *successfully*.
- *failure* – The operation failed.

Results

- *status* – The operation status message.

- *ssList* – The list of managed storage systems in SE based on the input **visibility**.

Operation: Manage ACLs for HBA Port

This operation adds or removes an HBA port from the storage volume's ACL. When adding an HBA port WWN to the storage volume's ACL, it also makes changes to the zone settings to make the volume accessible to the HBA port WWN. It doesn't make any changes on the zone side when removing the HBA port WWN from the Volume ACL.

Inputs

- *seCMSIP* – The Storage Essentials (SE) Central Management Server (CMS) IP address.
- *seUser* – The CMS username.
- *sePassword* – The CMS password.
- *initiatorWWN* – The HBA port WWN.
- *storageSystemName* – The name of the managed storage system in SE.
- *storageVolumeName* – The name of the storage volume in the storage system **storageSystemName**.
- *operationType* – This input can be any of the values in the selection list **SE–AddOrRemove**:
 - *Add* – Add the **initiatorWWN** to the storage volume **storageVolumeName** ACL.
 - *Remove* – Remove the **initiatorWWN** from the storage volume **storageVolumeName** ACL.

Responses

success – The operation completed successfully.

failure – The operation failed.

Results

status – The operation status message.

Operation: Get HBA Ports for Host

This operation collects the list of HBA port WWNs for the given host.

Inputs

- *seCMSIP* – The Storage Essentials (SE) Central Management Server (CMS) IP address.
- *seUser* – The CMS username.
- *sePassword* – The CMS password.
- *hostIP* – The IP address of the managed host in SE.

Responses

- *success* – The operation completed successfully.
- *failure* – The operation failed.

Results

- *status* – The operation status message.
- *portList* – The list of HBA ports of the given managed host in SE.

Operation: Add Default User

This operation adds default credentials for discovery.

Inputs

- *seCMSIP* – The Storage Essentials (SE) Central Management Server (CMS) IP address.
- *seUser* – The CMS username.
- *sePassword* – The CMS password.
- *userName* – The user name.
- *password* – The password.

Responses

- *success* – The operation was *successful*.
- *failure* – The operation failed.

Results

- *status* – The actual status message, which describes the *success* or *failure* of the operation. In case of *failure*, this will have the actual error message as described in the Error Codes section.
- *errorCode* – The integer value that describes the actual error code. An error detail for each *errorCode* is given in the Error Codes section.
- *invalidInputParameter* – This will have the invalid input parameter name when the return code is 1 or 2.

Operation: Remove Database

This operation removes the database **config** from the discovery list.

Inputs

- *seCMSIP* – The Storage Essentials (SE) Central Management Server (CMS) IP address.
- *seUser* – The CMS username.
- *sePassword* – The CMS password.
- *hostAddress* – The host IP Address or DNS name.
- *databaseServer* – The database server.
- *databaseType* – The database type. This input can have any of the values from the selection list **SE–DatabaseType**:
 - *oracle* (ORACLE)
 - *sqlserver* (SQLSERVER)
 - *sybase* (SYBASE)

- cache (CACHE)
- databasePort – The database port.

Responses

- *success* – The operation succeeded.
- *failure* – The operation failed.

Results

- *Status* – The actual status message, which describes the *success* or *failure* of the operation. In case of *failure*, this will have the actual error message as described in the Error Codes section.
- *errorCode* – The integer value that describes the actual error code. An error detail for each *errorCode* is given in the Error Codes section.
- *invalidInputParameter* – This will have the invalid input parameter name when the return code is 1 or 2.

Operation: Add Discovery Address Range

This operation adds or updates the discovery addresses or URL range for the discovery list.

Inputs

- seCMSIP – The Storage Essentials (SE) Central Management Server (CMS) IP address.
- seUser – The CMS username.
- sePassword – The CMS password.
- lowAddress – The low IP address for the discovery range.
- highAddress – The high IP address for the discovery range.
- userName – (Optional) The user name.
- password – (Optional) The password.
- comment – (Optional) A comment.
- startDiscovery – (Optional) Whether or not to start discovery after the operation adds or updates. This input can have any the following values from the selection list **SE–TrueOrFalse**:
 - true (Start Discovery)
 - false (Do not Start Discovery)

Responses

- *success* – The operation was *successful*.
- *failure* – The operation failed.

Results

- *status* – The actual status message, which describes the *success* or *failure* of the operation. In case of *failure*, this will have the actual error message as described in the Error Codes section.
- *errorCode* – The integer value that describes the actual error code. An error detail for each *errorCode* is given in the Error Codes section.

- *invalidInputParameter* – This will have the invalid input parameter name when the return code is 1 or 2.

Operation: Add Or Update Discovery Address

This operation adds or updates the discovery addresses or URL to the discovery list.

Inputs

- *seCMSIP* – The Storage Essentials (SE) Central Management Server (CMS) IP address.
- *seUser* – The CMS username.
- *sePassword* – The CMS password.
- *address* – The IP address or DNS name.
- *userName* – The user name.
- *password* – The password.
- *comment* – (Optional) A comment.
- *startDiscovery* – (Optional) Whether or not to start discovery after the operation adds or updates. This input can have a value from the **SE–TrueOrFalse** selection list:
 - *true* Start discovery.
 - *false* Do not start discovery.

Responses

- *success* – The operation was *successful*.
- *failure* – The operation failed.

Results

- *status* – The actual status message, which describes the *success* or *failure* of the operation. In case of *failure*, this will have the actual error message as described in the Error Codes section.
- *errorCode* – The integer value that describes the actual error code. An error detail for each *errorCode* is given in the Error Codes section.
- *invalidInputParameter* – This will have the invalid input parameter name when the return code is 1 or 2.

Note: Update is not supported and gives a **Not Supported** error.

Operation: Remove Discovery Address

This operation removes the discovery addresses or URLs from the discovery list.

Inputs

- *seCMSIP* – The Storage Essentials (SE) Central Management Server (CMS) IP address.
- *seUser* – The CMS username.
- *sePassword* – The CMS password.
- *address* – The IP address or DNS name.

Responses

- *success* – The operation was *successful*.
- *failure* – The operation failed.

Results

- *status* – The actual status message, which describes the *success* or *failure* of the operation. In case of *failure*, this will have the actual error message as described in the Error Codes section.
- *errorCode* – The integer value that describes the actual error code. An error detail for each *errorCode* is given in the Error Codes section.
- *invalidInputParameter* – This will have the invalid input parameter name when the return code is 1 or 2.

Operation: Get Topology

This operation starts the get topology of the address or URL provided.

Inputs

- *seCMSIP* – The Storage Essentials (SE) Central Management Server (CMS) IP address.
- *seUser* – The CMS username.
- *sePassword* – The CMS password.
- *name* – The element name.
- *elementType* – This input can have one the following values from the selection list **SE-ElementType**:
 - SS (storage system)
 - HOST (host)
 - SWITCH (Switch)

Responses

- *success* – The operation was *successful*.
- *failure* – The operation failed.

Results

- *status* – The actual status message, which describes the *success* or *failure* of the operation. In case of *failure*, this will have the actual error message as described in the Error Codes section.
- *errorCode* – The integer value that describes the actual error code. An error detail for each *errorCode* is given in the Error Codes section.
- *invalidInputParameter*– This will have the invalid input parameter name when the return code is 1 or 2.

Operation: Refresh Element Details

This operation starts the refresh element details of the element name provided.

Inputs

- seCMSIP – The Storage Essentials (SE) Central Management Server (CMS) IP address.
- seUser – The CMS username.
- sePassword – The CMS password.
- name – The element name.
- elementType – This input can have one the following values from the selection list **SE-ElementType**:
 - SS (storage system)
 - HOST (host)
 - SWITCH (Switch)

Responses

- *success* – The operation was *successful*.
- *failure* – The operation failed.

Results

- *status* – The actual status message, which describes the *success* or *failure* of the operation. In case of *failure*, this will have the actual error message as described in the Error Codes section.
- *errorCode* – The integer value that describes the actual error code. An error detail for each *errorCode* is given in the Error Codes section.
- *invalidInputParameter* – This will have the invalid input parameter name when the return code is 1 or 2.

Operation: Create Or Update Database

This operation creates or updates the database information.

Inputs

- seCMSIP – The Storage Essentials (SE) Central Management Server (CMS) IP address.
- seUser – The CMS username.
- sePassword – The CMS password.
- hostAddress – The host IP address or DNS name.
- managementAddress – (Optional) The management IP address or DNS name.
- databaseServer – The database server.
- databaseType – The database type. This input can have one the following values from the selection list **SE-DatabaseType**:
 - ORACLE
 - sqlserver (SQLSERVER)
 - sybase (SYBASE)
 - cache (CACHE)
- databasePort – The database port.

Responses

- *success* – The operation was successful.
- *failure* – The operation failed.

Results

- *status* – The actual status message, which describes the *success* or *failure* of the operation. In case of *failure*, this will have the actual error message as described in the Error Codes section.
- *errorCode* – The integer value, describes the actual Error Code. An error detail for each *errorCode* is given in the Error Codes section.
- *invalidInputParameter* – This will have the invalid input parameter name when the return code is 1 or 2.

Operation: Get Discovery Status

This operation gets the discovery status of the specified element name.

Inputs

- *seCMSIP* – The Storage Essentials (SE) Central Management Server (CMS) IP address.
- *seUser* – The CMS username.
- *sePassword* – The CMS password.
- *name* – The element name.
- *elementType* – This input can have one the following values from the selection list **SE-ElementType**:
 - SS (storage system)
 - HOST (host)
 - SWITCH (Switch)

Responses

- *success* – The operation was *successful*.
- *failure* – The operation failed.

Results

- *status* – The actual status message, which describes the *success* or *failure* of the operation. In case of *failure*, this will have the actual error message as described in the Error Codes section.
- *errorCode* – The integer value that describes the actual error code. An error detail for each *errorCode* is given in the Error Codes section.
- *invalidInputParameter* – This will have the invalid input parameter name when the return code is 1 or 2.
- *discoveryStatus* – The discovery status of the SE element.

Operation: Export Discovery List

This operation exports a discovery list from the SE CMS.

Inputs

- `seCMSIP` – The Storage Essentials (SE) Central Management Server (CMS) IP address.
- `seUser` – The CMS username.
- `sePassword` – The CMS password.
- `filePath` – The file path.
- `password` – (Optional) The password.

Responses

- *success* – The operation was successful.
- *failure* – The operation failed.

Results

- *status* – The actual status message, which describes the *success* or *failure* of the operation. In case of *failure*, this will have the actual error message as described in the Error Codes section.
- *errorCode* – The integer value, describes the actual Error Code. An error detail for each *errorCode* is given in the Error Codes section.
- *invalidInputParameter* – This will have the invalid input parameter name when the return code is 1 or 2.

Operation: Is Refresh Element Details In Progress

This operation gets the refresh element details progress of Storage Essentials.

Inputs

- `seCMSIP` – The Storage Essentials (SE) Central Management Server (CMS) IP address.
- `seUser` – The CMS username.
- `sePassword` – The CMS password.

Responses

- *success* – The operation was *successful*.
- *failure* – The operation failed.

Results

- *status* – The actual status message, which describes the *success* or *failure* of the operation. In case of *failure*, this will have the actual error message as described in the Error Codes section.
- *errorCode* – The integer value that describes the actual error code. An error detail for each *errorCode* is given in the Error Codes section.

- *invalidInputParameter* – This will have the invalid input parameter name when the return code is 1 or 2.

Operation: Get All Element Details

This operation starts the get all element details of the address or URL provided.

Inputs

- seCMSIP – The Storage Essentials (SE) Central Management Server (CMS) IP address.
- seUser – The CMS username.
- sePassword – The CMS password.
- name – The element name.
- elementType – This input can have one the following values from the selection list **SE-ElementType**:
 - SS (storage system)
 - HOST (host)
 - SWITCH (Switch)

Responses

- *success* – The operation was successful.
- *failure* – The operation failed.

Results

- *status* – The actual status message, which describes the *success* or *failure* of the operation. In case of *failure*, this will have the actual error message as described in the Error Codes section.
- *errorCode* – The integer value that describes the actual Error Code. An error detail for each *errorCode* is given in the Error Codes section.
- *invalidInputParameter* – This will have the invalid input parameter name when the return code is 1 or 2.

Operation: Import Discovery List

This operation adds or updates the discovery addresses or URL to the discovery list.

Inputs

- seCMSIP – The Storage Essentials (SE) Central Management Server (CMS) IP address.
- seUser – The CMS username.
- sePassword – The CMS password.
- filePath – The file path.
- password – (Optional) The password.

Responses

- *success* – The operation was successful.
- *failure* – The operation failed.

Results

- *status* – The actual status message, which describes the *success* or *failure* of the operation. In case of *failure*, this will have the actual error message as described in the Error Codes section.
- *errorCode* – The integer value, describes the actual Error Code. An error detail for each *errorCode* is given in the Error Codes section.
- *invalidInputParameter* – This will have the invalid input parameter name when the return code is 1 or 2.

Operation: Start Discovery

This operation starts the discover element of the address or URL provided.

Inputs

- *seCMSIP* – The Storage Essentials (SE) Central Management Server (CMS) IP address.
- *seUser* – The CMS username.
- *sePassword* – The CMS password.
- *address* – The IP address or DNS name.

Responses

- *success* – The operation was *successful*.
- *failure* – The operation failed.

Results

- *status* – The actual status message, which describes the *success* or *failure* of the operation. In case of *failure*, this will have the actual error message as described in the Error Codes section.
- *errorCode* – The integer value that describes the actual error code. An error detail for each *errorCode* is given in the Error Codes section.
- *invalidInputParameter* – This will have the invalid input parameter name when the return code is 1 or 2.

Operation: Parse Provisioning Details From XML

This operation gets the parse provisioning details from XML.

Inputs

- *provisioningXMLString*

Responses

- *success* – The operation was *successful*.
- *failure* – The operation failed.

Results

- *seCMSIP* – The Storage Essentials (SE) Central Management Server (CMS) IP address.
- *seUser* – The CMS username.
- *hostName* – The host name.
- *raidType* – This input can have a value from the **SE-RAIDtype** selection list:
 - non-redundant striped storage
 - redundant parity based storage
 - redundant mirrored storage
- *size* – The size of the storage volume.
- *storageVolumeName* – The storage volume name.
- *storageSystemsInZone* – The list of storageSystemsInZones separated by the special character “,”.
- *storageSystemsNotInZone* – The list of storageSystemsNotInZones separated by the special character “,”.

Operation: Modify Provisioning Details In XML

This operation modifies the provisioning details in XML.

Inputs

- provisioningXMLString
- storageSystemsInZone – (Optional) The list of storageSystemsInZones separated by the special character “,”.
- storageSystemsNotInZone – (Optional) The list of storageSystemsNotInZones separated by the special character “,”.

Responses

- *success* – The operation was *successful*.
- *failure* – The operation failed.

Results

- *provisioningXMLString*

Operation: Refresh SE On uCMDB

This operation refreshes Storage Essentials CIs on uCMDB.

Inputs

- seCMSIP – The Storage Essentials (SE) Central Management Server (CMS) IP address.
- seUser – The CMS username.
- sePassword – The CMS password.
- ucmdbServer – The uCMDB IP address.
- ucmdbUser – The uCMDB user name.
- ucmdbPassword. – The uCMDB password.

Responses

- *success* – The operation was *successful*.
- *failure* – The operation failed.

Results

- *status* – The actual status message, which describes the *success* or *failure* of the operation. In case of *failure*, this will have the actual error message as described in the Error Codes section.
- *errorCode* – The integer value that describes the actual error code. An error detail for each *errorCode* is given in the Error Codes section.
- *invalidInputParameter* – This will have the invalid input parameter name when the return code is 1 or 2.

Operation: Set Custom Name

This operation sets the custom name for any SE element.

Inputs

- seCMSIP – The Storage Essentials (SE) Central Management Server (CMS) IP address.
- seUser – The CMS username.
- sePassword – The CMS password.
- name – The element name.
- newName – The element new name.
- elementType – This input can have a value from the **SE–ElementType** selection list:
 - hsg – host security group
 - ss – storage system
 - host – host
 - switch – switch
- parentElementName – (Optional) The parent element name.

Responses

- *success* – The operation was *successful*.
- *failure* – The operation failed.

Results

status – The actual status message, which describes the *success* or *failure* of the operation. In case of *failure*, this will have the actual error message as described in the Error Codes section.

errorCode – The integer value that describes the actual error code. An error detail for each *errorCode* is given in the Error Codes section.

invalidInputParameter – This will have the invalid input parameter name when the return code is 1 or 2.

newName – The element's new name.

Operation: Refresh Materialized View

This operation refreshes the Storage Essentials Materialized view.

Inputs

- seCMSIP – The Storage Essentials (SE) Central Management Server (CMS) IP address.
- seUser – The CMS username.
- sePassword – The CMS password.
- synchronize – (Optional) Whether to wait until this operation completes. This input can have a value from the **SE–YesOrNo** selection list:
 - yes – Accept
 - no – Reject

Responses

- *success* – The operation was *successful*.
- *failure* – The operation failed.

Results

- *status* – The actual status message, which describes the *success* or *failure* of the operation. In case of *failure*, this will have the actual error message as described in the Error Codes section.
- *errorCode* – The integer value that describes the actual error code. An error detail for each *errorCode* is given in the Error Codes section.
- *invalidInputParameter* – This will have the invalid input parameter name when the return code is 1 or 2.

Operation: SE Connection

This operation connects to Storage Essentials.

Inputs

- seCMSIP – The Storage Essentials (SE) Central Management Server (CMS) IP address.
- seUser – The CMS username.
- sePassword – The CMS password.

Responses

- *success* – The operation was *successful*.
- *failure* – The operation failed.

Results

- *status* – The actual status message, which describes the *success* or *failure* of the operation. In case of *failure*, this will have the actual error message as described in the Error Codes section.
- *errorCode* – The integer value that describes the actual error code. An error detail for each *errorCode* is given in the Error Codes section.
- *invalidInputParameter* – This will have the invalid input parameter name when the return code is 1 or 2.

Operation: Convert Provisioning Details To XML

This operation converts provisioning details to XML.

Inputs

- *seCMSIP* – The Storage Essentials (SE) Central Management Server (CMS) IP address.
- *seUser* – The CMS username.
- *hostName* – The host name.
- *size* – The size of the storage volume.
- *storageVolumeName* – (Optional) The storage volume name.
- *raidType* – This input can have a value from the **SE-RAIDtype** selection list:
 - non-redundant striped storage
 - redundant parity based storage
 - redundant mirrored storage
- *storageSystemsInZone* – (Optional) The list of *storageSystemsInZones* separated by the special character “,”.
- *storageSystemsNotInZone* – (Optional) The list of *storageSystemsNotInZones* separated by the special character “,”.

Responses

- *success* – The operation was *successful*.
- *failure* – The operation failed.

Results

- *provisioningXMLString*

Operation: Disk Partition Run Script

This operation uses WMI to attempt to create a remote process on a machine. The command should be formatted as though it was run on the command line.

CAUTION: Internally, "cmd /c" gets prepended to the command passed in this operation. Also, "2>tempfile 1>tempfile" is appended to the command in order to capture stdout and stderr.

So your command will look like this when it is executed:

```
cmd /c [your command] 2>temperr 1>tempout
```

If you redirect the command yourself, the operation will only prepend "cmd /c" to the command and it will not retrieve any results.

Inputs

- host – The hostname or IP address of the target machine.
- command – The command you want executed.
- currentDirectory – The directory from which to run the command (leave blank for WMI default).
- user – Alternate credentials username (domain\user or remotemachine\user).
- password – Alternate credentials password.

Responses

- *success* – remote process *successfully* launched and has completed executing
- *failure* – unable to start remote process

Results

- *ReturnValue* – The return value from WMI for starting the process (not the exit value of the process).
- *ProcessID* – The process ID of the remote process.
- *StdOut* – The standard output from the remote process.
- *StdErr* – The standard error from the remote process.

Operation: Create Windows Host Drive Script

This operation uses WMI to attempt to create a remote process on a machine. The command should be formatted as though it was run on the command line.

CAUTION: Internally, "cmd /c" gets prepended to the command passed in this operation. Also, "2>tempfile 1>tempfile" gets appended to the command to capture stdout and stderr.

So, your command will look like this when executed:

```
cmd /c [your command] 2>temperr 1>tempout
```

If you redirect the command yourself, the operation will only prepend "cmd /c" to the command and it will not retrieve any results.

Inputs

- host – The host name or IP address of the target machine.
- command – The command you want executed.
- currentDirectory – The directory from which to run the command (leave blank for WMI default).
- user – Alternate credentials username (domain\user or remotemachine\user).
- password – Alternate credentials password.

Responses

- *success* – The remote process successfully launched and has completed executing.
- *failure* – Unable to start the remote process.

Results

- *ReturnValue* – The return value from WMI for starting the process (not the exit value of the process).
- *ProcessID* – The process ID of the remote process.
- *StdOut* – The standard output from the remote process.
- *StdErr* – The standard error from the remote process.

Operation: Disk Partition Rescan Cmd

This operation uses WMI to attempt to create a remote process on a machine. The command should be formatted as though it was run on the command line.

CAUTION: Internally, "cmd /c" gets prepended to the command passed in this operation. Also, "2>tempfile 1>tempfile" gets appended to the command to capture stdout and stderr.

So, your command will look like this when executed:

```
cmd /c [your command] 2>temperr 1>tempout
```

If you redirect the command yourself, the operation will only prepend "cmd /c" to the command and it will not retrieve any results.

Inputs

- *host* – The host name or IP address of the target machine.
- *command* – The command you want executed.
- *currentDirectory* – The directory from which to run the command (leave blank for WMI default).
- *user* – Alternate credentials username (domain\user or remotemachine\user).
- *password* – Alternate credentials password.

Responses

- *success* – The remote process successfully launched and has completed executing.
- *failure* – Unable to start the remote process.

Results

- *ReturnValue* – The return value from WMI for starting the process (not the exit value of the process).
- *ProcessID* – The process ID of the remote process.
- *StdOut* – The standard output from the remote process.
- *StdErr* – The standard error from the remote process.

Operation: Disk Partition Run Script SQL

This operation uses WMI to attempt to create a remote process on a machine. The command should be formatted as though it was run on the command line.

CAUTION: Internally, "cmd /c" gets prepended to the command passed in this operation. Also, "2>tempfile 1>tempfile" gets appended to the command to capture stdout and stderr.

So, your command will look like this when executed:

```
cmd /c [your command] 2>temperr 1>tempout
```

If you redirect the command yourself, the operation will only prepend "cmd /c" to the command and it will not retrieve any results.

Inputs

- host – The host name or IP address of the target machine.
- command – The command you want executed.
- currentDirectory – The directory from which to run the command (leave blank for WMI default).
- user – Alternate credentials username (domain\user or remotemachine\user).
- password – Alternate credentials password.

Responses

- *success* – The remote process successfully launched and has completed executing.
- *failure* – Unable to start the remote process.

Results

- *ReturnValue* – The return value from WMI for starting the process (not the exit value of the process).
- *ProcessID* – The process ID of the remote process.
- *StdOut* – The standard output from the remote process.
- *StdErr* – The standard error from the remote process.

Operation: Disk Partition Run Script Cmd

This operation uses WMI to attempt to create a remote process on a machine. The command passed should be formatted as though it was run on the command line.

CAUTION: Internally, "cmd /c" gets prepended to the command. Also, "2>tempfile 1>tempfile" gets appended to the command to capture stdout and stderr.

So, your command will look like this when executed:

```
cmd /c [your command] 2>temperr 1>tempout
```

If you redirect the command yourself, the operation will only prepend "cmd /c" to the command and it will not retrieve any results.

Inputs

- host – The host name or IP address of the target machine.
- command – The command you want executed.

- `currentDirectory` – The directory from which to run the command (leave blank for WMI default).
- `user` – Alternate credentials username (domain\user or remotemachine\user).
- `password` – Alternate credentials password.

Responses

- *success* – The remote process successfully launched and has completed executing.
- *failure* – Unable to start the remote process.

Results

- *ReturnValue* – The return value from WMI for starting the process (not the exit value of the process).
- *ProcessID* – The process ID of the remote process.
- *StdOut* – The standard output from the remote process.
- *StdErr* – The standard error from the remote process.

Operation: Get All Switch Ports

This operation gets all switch port WWNs.

Inputs

- `seCMSIP` – The Storage Essentials (SE) Central Management Server (CMS) IP address.
- `seUser` – The CMS username.
- `sePassword` – The CMS password.
- `applicationName` – The application name.
- `switchName` – The switch name.

Responses

- *success* – The operation was successful.
- *failure* – The operation failed.

Results

- *status* – The actual status message, which describes the *success* or *failure* of the operation. In case of *failure*, this will have the actual error message as described in the Error Codes section.
- *errorCode* – The integer value that describes the actual error code. An error detail for each *errorCode* is given in the Error Codes section.
- *invalidInputParameter* – This will have the invalid input parameter name when the return code is 1 or 2.
- *swPortWWNs* – The list of switch port WWNs separated by the special character “|”.

Operation: Get All Switches

This operation gets all switches.

Inputs

- seCMSIP – The Storage Essentials (SE) Central Management Server (CMS) IP address.
- seUser – The CMS username.
- sePassword – The CMS password.
- fabricName – The fabric name.

Responses

- *success* – The operation was successful.
- *failure* – The operation failed.

Results

- *status* – The actual status message, which describes the *success* or *failure* of the operation. In case of *failure*, this will have the actual error message as described in the Error Codes section.
- *errorCode* – The integer value that describes the actual error code. An error detail for each *errorCode* is given in the Error Codes section.
- *invalidInputParameter* – This will have the invalid input parameter name when the return code is 1 or 2.
- *switchNames* – The list of switch names separated by the special character "|".

Operation: Get Switch

This operation gets switch details.

Inputs

- seCMSIP – The Storage Essentials (SE) Central Management Server (CMS) IP address.
- seUser – The CMS username.
- sePassword – The CMS password.
- switchName – The switch name.

Responses

- *success* – The operation was successful.
- *failure* – The operation failed.

Results

- *status* – The actual status message, which describes the *success* or *failure* of the operation. In case of *failure*, this will have the actual error message as described in the Error Codes section.
- *errorCode* – The integer value that describes the actual error code. An error detail for each *errorCode* is given in the Error Codes section.
- *invalidInputParameter* – This will have the invalid input parameter name when the return code is 1 or 2.
- *ipAddress* – The IP address of the switch.
- *dnsName* – The DNS name of the switch.

- *switchWWN* – The WWN of the switch.
- *vendor* – The vendor name.
- *model* – The model name.
- *firmwareVersion* – The firmware version.
- *maxSwitchPorts* – The maximum switch ports.

Operation: Activate Zone

This operation activates a zone.

Inputs

- *seCMSIP* – The Storage Essentials (SE) Central Management Server (CMS) IP address.
- *seUser* – The CMS username.
- *sePassword* – The CMS password.
- *fabricName* – The fabric name.
- *zoneName* – The zone name.

Responses

- *success* – The operation was successful.
- *failure* – The operation failed.

Results

- *status* – The actual status message, which describes the *success* or *failure* of the operation. In case of *failure*, this will have the actual error message as described in the Error Codes section.
- *errorCode* – The integer value that describes the actual error code. An error detail for each *errorCode* is given in the Error Codes section.
- *invalidInputParameter* – This will have the invalid input parameter name when the return code is 1 or 2.

Operation: Create Zone

This operation creates a zone.

Inputs

- *seCMSIP* – The Storage Essentials (SE) Central Management Server (CMS) IP address.
- *seUser* – The CMS username.
- *sePassword* – The CMS password.
- *fabricName* – The fabric name.
- *zoneName* – (Optional) The zone name to be created.
- *WWN* – (Optional) The WWN to be added to the zone.
- *aliasName* – (Optional) The alias name to be added to the zone.

Responses

- *success* – The operation was successful.
- *failure* – The operation failed.

Results

- *status* – The actual status message, which describes the *success* or *failure* of the operation. In case of *failure*, this will have the actual error message as described in the Error Codes section.
- *errorCode* – The integer value that describes the actual error code. An error detail for each *errorCode* is given in the Error Codes section.
- *invalidInputParameter* – This will have the invalid input parameter name when the return code is 1 or 2.
- *zoneName* – The created zone name.

Operation: Deactivate Zone

This operation deactivates a zone.

Inputs

- *seCMSIP* – The Storage Essentials (SE) Central Management Server (CMS) IP address.
- *seUser* – The CMS username.
- *sePassword* – The CMS password.
- *fabricName* – The fabric name.
- *zoneName* – The zone name.

Responses

- *success* – The operation was successful.
- *failure* – The operation failed.

Results

- *status* – The actual status message, which describes the *success* or *failure* of the operation. In case of *failure*, this will have the actual error message as described in the Error Codes section.
- *errorCode* – The integer value that describes the actual error code. An error detail for each *errorCode* is given in the Error Codes section.
- *invalidInputParameter* – This will have the invalid input parameter name when the return code is 1 or 2.

Operation: Delete Zone

This operation deletes a zone.

Inputs

- *seCMSIP* – The Storage Essentials (SE) Central Management Server (CMS) IP address.

- seUser – The CMS username.
- sePassword – The CMS password.
- fabricName – The fabric name.
- zoneName – The zone name.

Responses

- *success* – The operation was successful.
- *failure* – The operation failed.

Results

- *status* – The actual status message, which describes the *success* or *failure* of the operation. In case of *failure*, this will have the actual error message as described in the Error Codes section.
- *errorCode* – The integer value that describes the actual error code. An error detail for each *errorCode* is given in the Error Codes section.
- *invalidInputParameter* – This will have the invalid input parameter name when the return code is 1 or 2.

Operation: Get All Zones

This operation gets all zones in the fabric.

Inputs

- seCMSIP – The Storage Essentials (SE) Central Management Server (CMS) IP address.
- seUser – The CMS username.
- sePassword – The CMS password.
- fabricName – The fabric name.
- activeStatus – This input can have a value from the **SE–ActiveStatus** selection list:
 - active – Consider only active elements.
 - inactive – Consider only inactive elements.
 - all – Consider all elements whether or not active.

Responses

- *success* – The operation was *successful*.
- *failure* – The operation failed.

Results

- *status* – The actual status message, which describes the *success* or *failure* of the operation. In case of *failure*, this will have the actual error message as described in the Error Codes section.
- *errorCode* – The integer value that describes the actual error code. An error detail for each *errorCode* is given in the Error Codes section.
- *invalidInputParameter* – This will have the invalid input parameter name when the return code is 1 or 2.
- *zoneNames* – The list of zone names separated by the special character "|".

Operation: Get Zone

This operation gets zone details.

Inputs

- seCMSIP – The Storage Essentials (SE) Central Management Server (CMS) IP address.
- seUser – The CMS username.
- sePassword – The CMS password.
- fabricName – The fabric name.
- zoneName – The zone name.

Responses

- *success* – The operation was successful.
- *failure* – The operation failed.

Results

- *status* – The actual status message, which describes the *success* or *failure* of the operation. In case of *failure*, this will have the actual error message as described in the Error Codes section.
- *errorCode* – The integer value that describes the actual error code. An error detail for each *errorCode* is given in the Error Codes section.
- *invalidInputParameter* – This will have the invalid input parameter name when the return code is 1 or 2.
- *aliasNames* – The list of alias names separated by the special character "|".
- *WWNs* – The list of WWNs separated by the special character "|".

Operation: Update Zone

This operation adds or removes members from a zone.

Inputs

- seCMSIP – The Storage Essentials (SE) Central Management Server (CMS) IP address.
- seUser – The CMS username.
- sePassword – The CMS password.
- fabricName – The fabric name.
- zoneName – The zone name .
- addOrRemove – This input can have a value from the **SE–AddOrRemove** selection list:
 - add – Add operation.
 - remove – Remove operation.
- WWN – (Optional) The WWN.
- aliasName – (Optional) The alias name.

Responses

- *success* – The operation was *successful*.
- *failure* – The operation failed.

Results

- *status* – The actual status message, which describes the *success* or *failure* of the operation. In case of *failure*, this will have the actual error message as described in the Error Codes section.
- *errorCode* – The integer value that describes the actual error code. An error detail for each *errorCode* is given in the Error Codes section.
- *invalidInputParameter* – This will have the invalid input parameter name when the return code is 1 or 2.

Operation: Create Zone Alias

This operation creates a zone alias.

Inputs

- *seCMSIP* – The Storage Essentials (SE) Central Management Server (CMS) IP address.
- *seUser* – The CMS username.
- *sePassword* – The CMS password.
- *fabricName* – The fabric name.
- *aliasName* – (Optional) The alias name to be updated in the zone.
- *WWN* – The WWN to be updated in the zone.

Responses

- *success* – The operation was *successful*.
- *failure* – The operation failed.

Results

- *status* – The actual status message, which describes the *success* or *failure* of the operation. In case of *failure*, this will have the actual error message as described in the Error Codes section.
- *errorCode* – The integer value that describes the actual error code. An error detail for each *errorCode* is given in the Error Codes section.
- *invalidInputParameter* – This will have the invalid input parameter name when the return code is 1 or 2.

Operation: Delete Zone Alias

This operation deletes a zone alias.

Inputs

- *seCMSIP* – The Storage Essentials (SE) Central Management Server (CMS) IP address.

- seUser – The CMS username.
- sePassword – The CMS password.
- fabricName – The fabric name.
- aliasName – The alias name.

Responses

- *success* – The operation was *successful*.
- *failure* – The operation failed.

Results

- *status* – The actual status message, which describes the *success* or *failure* of the operation. In case of *failure*, this will have the actual error message as described in the Error Codes section.
- *errorCode* – The integer value that describes the actual error code. An error detail for each *errorCode* is given in the Error Codes section.
- *invalidInputParameter* – This will have the invalid input parameter name when the return code is 1 or 2.

Operation: Get All Zone Aliases

This operation gets all zone aliases in the fabric.

Inputs

- seCMSIP – The Storage Essentials (SE) Central Management Server (CMS) IP address.
- seUser – The CMS username.
- sePassword – The CMS password.
- fabricName – The fabric name.

Responses

- *success* – The operation was *successful*.
- *failure* – The operation failed.

Results

- *status* – The actual status message, which describes the *success* or *failure* of the operation. In case of *failure*, this will have the actual error message as described in the Error Codes section.
- *errorCode* – The integer value that describes the actual error code. An error detail for each *errorCode* is given in the Error Codes section.
- *invalidInputParameter* – This will have the invalid input parameter name when the return code is 1 or 2.
- *aliasNames* – The list of alias names separated by the special character "|".

Operation: Get Zone Alias

This operation gets zone alias details.

Inputs

- seCMSIP – The Storage Essentials (SE) Central Management Server (CMS) IP address.
- seUser – The CMS username.
- sePassword – The CMS password.
- fabricName – The fabric name.
- aliasName – The alias name.

Responses

- *success* – The operation was *successful*.
- *failure* – The operation failed.

Results

- *status* – The actual status message, which describes the *success* or *failure* of the operation. In case of *failure*, this will have the actual error message as described in the Error Codes section.
- *errorCode* – The integer value that describes the actual error code. An error detail for each *errorCode* is given in the Error Codes section.
- *invalidInputParameter* – This will have the invalid input parameter name when the return code is 1 or 2.
- *WWNs* – The list of WWNs in the alias separated by the special character " |".

Operation: Update Zone Alias

This operation adds or removes WWNs from a zone alias.

Inputs

- seCMSIP – The Storage Essentials (SE) Central Management Server (CMS) IP address.
- seUser – The CMS username.
- sePassword – The CMS password.
- fabricName – The fabric name.
- aliasName – The alias name.
- addOrRemove – This input can have a value from the **SE–AddOrRemove** selection list:
 - add – Add operation.
 - remove – Remove operation.
- WWN – The WWN to be updated in the zone alias

Responses

- *success* – The operation was *successful*.
- *failure* – The operation failed.

Results

- *status* – The actual status message, which describes the *success* or *failure* of the operation. In case of *failure*, this will have the actual error message as described in the Error Codes section.
- *errorCode* – The integer value that describes the actual error code. An error detail for each *errorCode* is given in the Error Codes section.
- *invalidInputParameter* – This will have the invalid input parameter name when the return code is 1 or 2.

Operation: Activate Zone Set

This operation activates a zone set.

Inputs

- *seCMSIP* – The Storage Essentials (SE) Central Management Server (CMS) IP address.
- *seUser* – The CMS username.
- *sePassword* – The CMS password.
- *fabricName* – The fabric name.
- *zoneSetName* – The zone set name.

Responses

- *success* – The operation was *successful*.
- *failure* – The operation failed.

Results

- *status* – The actual status message, which describes the *success* or *failure* of the operation. In case of *failure*, this will have the actual error message as described in the Error Codes section.
- *errorCode* – The integer value that describes the actual error code. An error detail for each *errorCode* is given in the Error Codes section.
- *invalidInputParameter* – This will have the invalid input parameter name when the return code is 1 or 2.

Operation: Create Zone Set

This operation creates a zone set.

Inputs

- *seCMSIP* – The Storage Essentials (SE) Central Management Server (CMS) IP address.
- *seUser* – The CMS username.
- *sePassword* – The CMS password.
- *fabricName* – The fabric name.
- *zoneSetName* – (Optional) The zone set name.
- *zoneNames* – The list of zone names separated by the special character "|".

Responses

- *success* – The operation was *successful*.
- *failure* – The operation failed.

Results

- *status* – The actual status message, which describes the *success* or *failure* of the operation. In case of *failure*, this will have the actual error message as described in the Error Codes section.
- *errorCode* – The integer value that describes the actual error code. An error detail for each *errorCode* is given in the Error Codes section.
- *invalidInputParameter* – This will have the invalid input parameter name when the return code is 1 or 2.
- *zoneSetName* – The created zone set name.

Operation : Delete Zone Set

This operation deletes a zone set.

Inputs

- *seCMSIP* – The Storage Essentials (SE) Central Management Server (CMS) IP address.
- *seUser* – The CMS username.
- *sePassword* – The CMS password.
- *fabricName* – The fabric name.
- *zoneSetName* – The zone set name.

Responses

- *success* – The operation was *successful*.
- *failure* – The operation failed.

Results

- *status* – The actual status message, which describes the *success* or *failure* of the operation. In case of *failure*, this will have the actual error message as described in the Error Codes section.
- *errorCode* – The integer value that describes the actual error code. An error detail for each *errorCode* is given in the Error Codes section.
- *invalidInputParameter* – This will have the invalid input parameter name when the return code is 1 or 2.

Operation : Get All Zone Sets

This operation gets all zone sets in the fabric.

Inputs

- *seCMSIP* – The Storage Essentials (SE) Central Management Server (CMS) IP address.

- seUser – The CMS username.
- sePassword – The CMS password.
- fabricName – The fabric name.
- activeStatus – This input can have a value from the **SE–ActiveStatus** selection list:
 - active – Consider only active elements.
 - inactive – Consider only inactive elements.
 - all – Consider all elements whether active or not.

Responses

- *success* – The operation was *successful*.
- *failure* – The operation failed.

Results

- *status* – The actual status message, which describes the *success* or *failure* of the operation. In case of *failure*, this will have the actual error message as described in the Error Codes section.
- *errorCode* – The integer value that describes the actual error code. An error detail for each *errorCode* is given in the Error Codes section.
- *invalidInputParameter* – This will have the invalid input parameter name when the return code is 1 or 2.
- *zoneSetName* – The list of zone set names separated by the special character "|".

Operation: Get Zone Set

This operation gets zone set details.

Inputs

- seCMSIP – The Storage Essentials (SE) Central Management Server (CMS) IP address.
- seUser – The CMS username.
- sePassword – The CMS password.
- fabricName – The fabric name.
- zoneSetName – The zone set name.

Responses

- *success* – The operation was *successful*.
- *failure* – The operation failed.

Results

- *status* – The actual status message, which describes the *success* or *failure* of the operation. In case of *failure*, this will have the actual error message as described in the Error Codes section.
- *errorCode* – The integer value that describes the actual error code. An error detail for each *errorCode* is given in the Error Codes section.
- *invalidInputParameter* – This will have the invalid input parameter name when the return code is 1 or 2.

- *zoneNames* – The list of zone names separated by the special character “|”.
- *isActive* – Active status.

Operation: Update Zone Set

This operation adds or removes a member from a zone set.

Inputs

- *seCMSIP* – The Storage Essentials (SE) Central Management Server (CMS) IP address.
- *seUser* – The CMS username.
- *sePassword* – The CMS password.
- *fabricName* – The fabric name.
- *zoneSetName* – The zone set name.
- *addOrRemove* – This input can have a value from the **SE–AddOrRemove** selection list:
 - *add* – Add operation.
 - *remove* – Remove operation.
 - *zoneName* – The zone name.

Responses

- *success* – The operation was *successful*.
- *failure* – The operation failed.

Results

- *status* – The actual status message, which describes the *success* or *failure* of the operation. In case of *failure*, this will have the actual error message as described in the Error Codes section.
- *errorCode* – The integer value that describes the actual error code. An error detail for each *errorCode* is given in the Error Codes section.
- *invalidInputParameter* – This will have the invalid input parameter name when the return code is 1 or 2.

Operation: Get All Fabrics

This operation gets all fabrics.

Inputs

- *seCMSIP* – The Storage Essentials (SE) Central Management Server (CMS) IP address.
- *seUser* – The CMS username.
- *sePassword* – The CMS password.
- *onlyManaged* – (Optional) Whether or not to consider only the managed element.

Responses

- *success* – The operation was *successful*.

- *failure* – The operation failed.

Results

- *status* – The actual status message, which describes the *success* or *failure* of the operation. In case of *failure*, this will have the actual error message as described in the Error Codes section.
- *errorCode* – The integer value that describes the actual error code. An error detail for each *errorCode* is given in the Error Codes section.
- *invalidInputParameter* – This will have the invalid input parameter name when the return code is 1 or 2.
- *fabricNames* – The list of the fabric names, separated by the special character “|”.

Operation: Get All FC Ports

This operation gets all of the FC ports in a fabric.

Inputs

- *seCMSIP* – The Storage Essentials (SE) Central Management Server (CMS) IP address.
- *seUser* – The CMS username.
- *sePassword* – The CMS password.
- *fabricName* – The fabric name.

Responses

- *success* – The operation was *successful*.
- *failure* – The operation failed.

Results

- *status* – The actual status message, which describes the *success* or *failure* of the operation. In case of *failure*, this will have the actual error message as described in the Error Codes section.
- *errorCode* – The integer value that describes the actual error code. An error detail for each *errorCode* is given in the Error Codes section.
- *invalidInputParameter* – This will have the invalid input parameter name when the return code is 1 or 2.
- *WWNs* – The list of WWNs separated by the special character “|”.

Operation: Get The Fabric Name for a Specified Port

This operation gets the fabric name for a specified host or storage FC port.

Inputs

- *seCMSIP* – The Storage Essentials (SE) Central Management Server (CMS) IP address.
- *seUser* – The CMS username.
- *sePassword* – The CMS password.

- WWN – The WWN of the host or storage FC port for which the fabric name is to be retrieved.

Responses

- *success* – The operation was *successful*.
- *failure* – The operation failed.

Results

- *status* – The actual status message, which describes the *success* or *failure* of the operation. In case of *failure*, this will have the actual error message as described in the Error Codes section.
- *errorCode* – The integer value that describes the actual error code. An error detail for each *errorCode* is given in the Error Codes section.
- *invalidInputParameter* – This will have the invalid input parameter name when the return code is 1 or 2.
- *fabricName* – The fabric name of the host or storage FC port.

Operation: Get fabric Port WWNs Mapping

This operation gets a list of fabric and FC ports for a storage system and host.

Inputs

- *seCMSIP* – The Storage Essentials (SE) Central Management Server (CMS) IP address.
- *seUser* – The CMS username.
- *sePassword* – The CMS password.
- *hostName* – The host name.
- *storageSystemName* – The storage system name.

Responses

- *success* – The operation was *successful*.
- *failure* – The operation failed.

Results

- *status* – The actual status message, which describes the *success* or *failure* of the operation. In case of *failure*, this will have the actual error message as described in the Error Codes section.
- *errorCode* – The integer value that describes the actual error code. An error detail for each *errorCode* is given in the Error Codes section.
- *invalidInputParameter* – This will have the invalid input parameter name when the return code is 1 or 2.
- *fabricAndFCPortWWNsMapping* – The fabric and FC port WWNs mapping.

Operation: Get Zone Aliases For a Specified Port

This operation gets the zone aliases related to the specified port WWN.

Inputs

- seCMSIP – The Storage Essentials (SE) Central Management Server (CMS) IP address.
- seUser – The CMS username.
- sePassword – The CMS password.
- WWN – The WWN of the host or storage FC port for which alias names are to be retrieved.

Responses

- *success* – The operation was *successful*.
- *failure* – The operation failed.

Results

- *status* – The actual status message, which describes the *success* or *failure* of the operation. In case of *failure*, this will have the actual error message as described in the Error Codes section.
- *errorCode* – The integer value that describes the actual error code. An error detail for each *errorCode* is given in the Error Codes section.
- *invalidInputParameter* – This will have the invalid input parameter name when the return code is 1 or 2.
- *aliasNames* – The list of alias names separated by the special character “,”.

Operation: Get Zones For a Specified Port

This operation gets all zones related to the specified port WWN.

Inputs

- seCMSIP – The Storage Essentials (SE) Central Management Server (CMS) IP address.
- seUser – The CMS username.
- sePassword – The CMS password.
- hostName – The host name.
- hbaPortWWN – The HBA port WWN.
- activeStatus – This input can have a value from the **SE–ActiveStatus** selection list:
 - active – Consider only active elements.
 - inactive – Consider only inactive elements.
 - all – Consider all elements whether active or not.

Responses

- *success* – The operation was *successful*.
- *failure* – The operation failed.

Results

- *status* – The actual status message, which describes the *success* or *failure* of the operation. In case of *failure*, this will have the actual error message as described in the Error Codes section.

- *errorCode* – The integer value that describes the actual error code. An error detail for each *errorCode* is given in the Error Codes section.
- *invalidInputParameter* – This will have the invalid input parameter name when the return code is 1 or 2.
- *zoneNames* – The list of zone names separated by the special character “|”.

Versions and components

Operations Orchestration Version	HP Storage Essentials
7.51	6.X

VMware flows are supported with SE 6.0 SP4 and later versions.

Installation and configuration instructions

SE Policy Manager configuration

Policy Manager can automatically send an e-mail, generate an event, or run a custom script when an element is being overused or when one of the following events occurs:

- A new element is discovered
- Successful provisioning has occurred
- An event occurs on one or more specified elements

Policy Manager allows you to create the Utilization policies that monitor the utilization of an element. The options provided depend on the type of element that is utilized.

For example, you can configure Policy Manager so that you receive an e-mail message when the amount of free space on a server for an Oracle database decreases to a specified level or have it run a script which uses RSFlowInvoke and executes the **End-to-End Oracle Storage Provisioning** flow from the **Storage Automation** accelerator pack to expand the Oracle ASM disk group.

For more details on SE Policy Manager, refer to the *SE User Guide*.

Troubleshooting

General troubleshooting procedures

<To be added>

Errors that <the particular integration pack> operations return

<To be added>

Launching flows

Launching flows through URL or as Subflows

1. All flows can be manually launched from the flow library after logging on to the OO Central Web site. The flows can be found under on the **Flow Library** tab in **Library > Accelerator Packs > Storage Automation**.
2. To create a linked URL that can start a flow run, click the **Flow Library** tab, navigate to the flow, and then click the flow name to open the preview of the flow. Under **Execution Links**, select the URL in the text box of the desired type of run (either **Guided Run** or **Run All**).

Refer to the below example (**Add or Remove HBA from volume ACL – using Change Ticket**) for providing inputs in the URL to the flow.

[https://<OO Central IP>:<port>/PAS/app?service=RCLinkService/FlowLinkDispatch&sp=SNEWRUNALL&sp=S8f783bfe-2101-45e8-9f22-5554404ec3b2&sp=L0&smServerIP=<smServerIP>&smUser=<smUser>&smThe password.=<s,password>""&changeID=<changeid>&seCMSIP=<seCMSIP>&seUser=<seUser>&sePassword=<sePassword>&hostIP=<hostip>&initiatorWWN=<initiatorWWN>&storageSystemName=<storageSystemName>&storageVolumeName=<storageVolumeName>&addOrRemove=<addOrRemove>](https://<OO Central IP>:<port>/PAS/app?service=RCLinkService/FlowLinkDispatch&sp=SNEWRUNALL&sp=S8f783bfe-2101-45e8-9f22-5554404ec3b2&sp=L0&smServerIP=<smServerIP>&smUser=<smUser>&smThe password.=<s,password>)

where <OO Central IP>:Ports is the IP address and the port on which the OO Central is running.

The parameters are:

- smServerIP – The SM server name or IP address.
- smUser – The SM username.
- smThe password. – The SM password.
- changeID – The ticket ID for the **Add or Remove HBA WWN from Volume's ACL** change created on the Service Manager.
- seCMSIP – The Storage Essentials (SE) Central Management Server (CMS) IP address.
- seUser – The CMS username.
- sePassword – The CMS password.
- initiatorWWN – The HBA port WWN.
- storageSystemName – The name of the managed storage system in SE.
- storageVolumeName – The name of the storage volume in the storage system **storageSystemName**.
- addOrRemove – This can be any of the values in the selection list **SE-AddOrRemove**:
 - Add – Add the **initiatorWWN** to the storage volume **storageVolumeName** ACL
 - Remove – Remove the **initiatorWWN** from the storage volume **storageVolumeName** ACL.

Launching flows through RSFlowInvoke utility

The RSFlowInvoke utility is used to launch flows in unattended (headless) mode.

Syntax:

```
RSFlowInvoke.exe <url> [-host -flow -inputs <inputs> -u -p -a -ep -rc -rw -t -v -verbose]
```

-host <host>
-flow <flow> name or UUID
-inputs <inputs> name=value&name2=value2
-u <username>
-p <password>
-ep <encrypted password>
-a <authType>[Basic, Digest]
-t <timeout out (seconds)> default=100
-v || -verbose all output is written to the screen
-rc <retry count> default=0 max=30
-rw <retry wait (seconds)> default=5

Example

RSFlowInvoke.exe

-host localhost
-flow "Library/Accelerator Packs/Storage Automation/Provision Storage for a server using Storage Essentials"
-inputs "seCMSIP=192.168.1.1&name=testvol1&redundancy=Non-Redundant Striped Storage&server=<hostname>&size=2"
-u admin
-p password

Security

The flows that are not integrated with the Service Manager Change Management process can only be seen and executed by an OO user who has admin privileges.

Tools

JRSFlowInvoke

A command-line tool with which flows can be started from outside the OO Central Web application.

Web Service Wizard

A tool that displays a list of the methods in the interface of the specified Web service. Within the wizard, you choose the methods that you want to use, and the wizard creates the HP OO operations that can execute the methods.

Limitations

1. RAID 0 GROUP mapping to a host in an HDS array will result in an error. However, RAID 1 and RAID 5 are supported in HDS through Storage Essentials.
2. If a host is connected to two switches in the same fabric and an EMC CLARiiON array is connected to only one of the switches, the HSG creation fails.
3. When a flow is executed in an SIM/SE integrated environment, if a user is logged on the SIM/SE GUI, that user will be logged off the GUI. It is advisable to use a different set of users for flow execution to avoid this issue.
4. The **Oracle Data Migration and Provision Storage to host** and the **Update and Approve Change Ticket and Execute** flows do not support headless/REST execution.
5. Switch ports are not supported for zone and zone alias creation.
6. Oracle Data Migration flows support only Windows hosts.
7. If the zone does not exist between an EMC Symmetrix DMX array and the host for which storage needs to be assigned, the flow may stop with a RAS timeout error.

In this case, the current step will succeed, but the flow will not continue. This implies that the rollback will not happen in the Provisioning work flow in case of an error in current step. The status of the operations need to be checked using HP Storage Essentials. This limitation is only for the flows in the **Library > Accelerator Packs > Storage Automation > Deprecated** folder.

Support matrix

Arrays	Switches	Hosts	Multipathing software	Applications
1. MSA 2. EVA 3. XP 4. IBM 5. LSI 6. EMC CLARiiON 7. EMC Symmetrix 8.HDS	1. Cisco 2. McData 3. QLogic 4. Brocade	1. Windows 2. HP-UX(IA and PA)	1. Secure Path 2. MPIO	1. Oracle 10gR2 with ASM 2. HP Service Manager 7.0 3. uCMDB 7.5

Note: Supported IBM Provider for SP4 is 5.2.0.