



## Storage-Related Policies

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## Configuring vHBA Templates

### vHBA Template

This template is a policy that defines how a vHBA on a server connects to the SAN. It is also referred to as a vHBA SAN connectivity template.

You must include this policy in a service profile for it to take effect.

### Configuring a vHBA Template

#### Procedure

	Command or Action	Purpose
<b>Step 1</b>	UCS-A# <b>scope org</b> <i>org-name</i>	Enters organization mode for the specified organization. To enter the root organization mode, type <i>/</i> as the <i>org-name</i> .
<b>Step 2</b>	UCS-A /org # <b>create vhba-templ</b> <i>vhba-templ-name</i> [ <b>fabric</b> { <i>a</i>   <i>b</i> }] [ <b>fc-if</b> <i>vsan-name</i> ]	Creates a vHBA template and enters organization vHBA template mode.
<b>Step 3</b>	(Optional) UCS-A /org/vhba-templ # <b>set descr</b> <i>description</i>	Provides a description for the vHBA template.
<b>Step 4</b>	(Optional) UCS-A /org/vhba-templ # <b>set fabric</b> { <i>a</i>   <i>b</i> }	Specifies the fabric to use for the vHBA. If you did not specify the fabric when creating the vHBA template in Step 2, then you have the option to specify it with this command.

	Command or Action	Purpose
<b>Step 5</b>	(Optional) UCS-A /org/vhba-templ # <b>set fc-if</b> <i>vsan-name</i>	Specifies the Fibre Channel interface (named VSAN) to use for the vHBA template. If you did not specify the Fibre Channel interface when creating the vHBA template in Step 2, you have the option to specify it with this command.
<b>Step 6</b>	UCS-A /org/vhba-templ # <b>set max-field-size</b> <i>size-num</i>	Specifies the maximum size of the Fibre Channel frame payload (in bytes) that the vHBA supports.
<b>Step 7</b>	UCS-A /org/vhba-templ # <b>set pin-group</b> <i>group-name</i>	Specifies the pin group to use for the vHBA template.
<b>Step 8</b>	UCS-A /org/vhba-templ # <b>set qos-policy</b> <i>mac-pool-name</i>	Specifies the QoS policy to use for the vHBA template.
<b>Step 9</b>	UCS-A /org/vhba-templ # <b>set stats-policy</b> <i>policy-name</i>	Specifies the server and server component statistics threshold policy to use for the vHBA template.
<b>Step 10</b>	UCS-A /org/vhba-templ # <b>set type</b> { <b>initial-template</b>   <b>updating-template</b> }	Specifies the vHBA template update type. If you do not want vHBA instances created from this template to be automatically updated when the template is updated, use the <b>initial-template</b> keyword; otherwise, use the <b>updating-template</b> keyword to ensure that all vHBA instances are updated when the vHBA template is updated.
<b>Step 11</b>	UCS-A /org/vhba-templ # <b>set wwpn-pool</b> <i>pool-name</i>	Specifies the WWPN pool to use for the vHBA template.
<b>Step 12</b>	UCS-A /org/vhba-templ # <b>commit-buffer</b>	Commits the transaction to the system configuration.

### Example

The following example configures a vHBA template and commits the transaction:

```
UCS-A# scope org /
UCS-A /org* # create vhba template VhbaTempFoo
UCS-A /org/vhba-templ* # set descr "This is a vHBA template example."
UCS-A /org/vhba-templ* # set fabric a
UCS-A /org/vhba-templ* # set fc-if accounting
UCS-A /org/vhba-templ* # set max-field-size 2112
UCS-A /org/vhba-templ* # set pin-group FcPinGroup12
UCS-A /org/vhba-templ* # set qos-policy policy34foo
UCS-A /org/vhba-templ* # set stats-policy ServStatsPolicy
UCS-A /org/vhba-templ* # set type updating-template
UCS-A /org/vhba-templ* # set wwpn-pool SanPool7
UCS-A /org/vhba-templ* # commit-buffer
UCS-A /org/vhba-templ #
```

## Deleting a vHBA Template

### Procedure

	Command or Action	Purpose
<b>Step 1</b>	UCS-A# <b>scope org</b> <i>org-name</i>	Enters organization mode for the specified organization. To enter the root organization mode, type <i>/</i> as the <i>org-name</i> .
<b>Step 2</b>	UCS-A /org # <b>delete vhma-templ</b> <i>vhba-templ-name</i>	Deletes the specified vHBA template.
<b>Step 3</b>	UCS-A /org # <b>commit-buffer</b>	Commits the transaction to the system configuration.

### Example

The following example deletes the vHBA template named VhmaTempFoo and commits the transaction:

```
UCS-A# scope org /
UCS-A /org # delete vhma template VhmaTempFoo
UCS-A /org* # commit-buffer
UCS-A /org #
```

## Configuring Fibre Channel Adapter Policies

### Ethernet and Fibre Channel Adapter Policies

These policies govern the host-side behavior of the adapter, including how the adapter handles traffic. For example, you can use these policies to change default settings for the following:

- Queues
- Interrupt handling
- Performance enhancement
- RSS hash
- Failover in a cluster configuration with two fabric interconnects

**Note**

For Fibre Channel adapter policies, the values displayed by Cisco UCS Manager may not match those displayed by applications such as QLogic SANsurfer. For example, the following values may result in an apparent mismatch between SANsurfer and Cisco UCS Manager:

- **Max LUNs Per Target**—SANsurfer has a maximum of 256 LUNs and does not display more than that number. Cisco UCS Manager supports a higher maximum number of LUNs.
- **Link Down Timeout**—In SANsurfer, you configure the timeout threshold for link down in seconds. In Cisco UCS Manager, you configure this value in milliseconds. Therefore, a value of 5500 ms in Cisco UCS Manager displays as 5s in SANsurfer.
- **Max Data Field Size**—SANsurfer has allowed values of 512, 1024, and 2048. Cisco UCS Manager allows you to set values of any size. Therefore, a value of 900 in Cisco UCS Manager displays as 512 in SANsurfer.
- **LUN Queue Depth**—The LUN queue depth setting is available for Windows system FC adapter policies. Queue depth is the number of commands that the HBA can send and receive in a single transmission per LUN. Windows Storport driver sets this to a default value of 20 for physical miniports and to 250 for virtual miniports. This setting adjusts the initial queue depth for all LUNs on the adapter. Valid range for this value is 1 - 254. The default LUN queue depth is 20. This feature only works with Cisco UCS Manager version 3.1(2) and higher.
- **IO TimeOut Retry**—When the target device does not respond to an IO request within the specified timeout, the FC adapter cancels the pending command then resends the same IO after the timer expires. The FC adapter valid range for this value is 1 - 59 seconds. The default IO retry timeout is 5 seconds. This feature only works with Cisco UCS Manager version 3.1(2) and higher.

### Operating System Specific Adapter Policies

By default, Cisco UCS provides a set of Ethernet adapter policies and Fibre Channel adapter policies. These policies include the recommended settings for each supported server operating system. Operating systems are sensitive to the settings in these policies. Storage vendors typically require non-default adapter settings. You can find the details of these required settings on the support list provided by those vendors.

**Important**

We recommend that you use the values in these policies for the applicable operating system. Do not modify any of the values in the default policies unless directed to do so by Cisco Technical Support.

However, if you are creating an Ethernet adapter policy for an OS (instead of using the default adapter policy), you must use the following formulas to calculate values that work for that OS.

### Interrupt Count in Linux Adapter Policies

Drivers on Linux operating systems use differing formulas to calculate the Interrupt Count, depending on the eNIC driver version. The UCS 3.2 release increased the number of Tx and Rx queues for the eNIC driver from 8 to 256 each.

Use one of the following strategies, according to your driver version.

For Linux drivers before the UCS 3.2 firmware release, use the following formula to calculate the Interrupt Count.

Completion Queues = Transmit Queues + Receive Queues

Interrupt Count = (Completion Queues + 2) rounded up to nearest power of 2

For example, if Transmit Queues = 1 and Receive Queues = 8 then:

Completion Queues = 1 + 8 = 9

Interrupt Count = (9 + 2) rounded up to the nearest power of 2 = 16

On drivers for UCS firmware release 3.2 and higher, the Linux eNIC drivers use the following formula to calculate the Interrupt Count.

Interrupt Count = (#Tx or Rx Queues) + 2

For example:

Interrupt Count wq = 32, rq = 32, cq = 64 - then Interrupt Count = Max(32, 32) + 2 = 34

Interrupt Count wq = 64, rq = 8, cq = 72 - then Interrupt Count = Max(64, 8) + 2 = 66

Interrupt Count wq = 1, rq = 16, cq = 17 - then Interrupt count = Max(1, 16) + 2 = 18

## Configuring a Fibre Channel Adapter Policy

### Procedure

	Command or Action	Purpose
<b>Step 1</b>	UCS-A# <b>scope org</b> <i>org-name</i>	Enters organization mode for the specified organization. To enter the root organization mode, type / as the <i>org-name</i> .
<b>Step 2</b>	UCS-A /org # <b>create fc-policy</b> <i>policy-name</i>	Creates the specified Fibre Channel adapter policy and enters organization Fibre Channel policy mode.
<b>Step 3</b>	(Optional) UCS-A /org/fc-policy # <b>set descr</b> <i>description</i>	Provides a description for the policy.  <b>Note</b> If your description includes spaces, special characters, or punctuation, you must begin and end your description with quotation marks. The quotation marks will not appear in the description field of any <b>show</b> command output.
<b>Step 4</b>	(Optional) UCS-A /org/fc-policy # <b>set error-recovery</b> { <b>fc-error-recovery</b> { <b>disabled</b>   <b>enabled</b> }   <b>link-down-timeout</b> <i>timeout-msec</i>   <b>port-down-io-retry-count</b> <i>retry-count</i>   <b>port-down-timeout</b> <i>timeout-msec</i> }	Configures the Fibre Channel error recovery.
<b>Step 5</b>	(Optional) UCS-A /org/fc-policy # <b>set interrupt mode</b> { <b>intx</b>   <b>msi</b>   <b>msi-x</b> }	Configures the driver interrupt mode.

	Command or Action	Purpose
<b>Step 6</b>	(Optional) UCS-A /org/fc-policy # <b>set port</b> { <b>io-throttle-count</b> <i>throttle-count</i>   <b>max-luns</b> <i>max-num</i> }	Configures the Fibre Channel port.
<b>Step 7</b>	(Optional) UCS-A /org/fc-policy # <b>set port-f-logi</b> { <b>retries</b> <i>retry-count</i>   <b>timeout</b> <i>timeout-msec</i> }	Configures the Fibre Channel port fabric login (FLOGI).
<b>Step 8</b>	(Optional) UCS-A /org/fc-policy # <b>set port-p-logi</b> { <b>retries</b> <i>retry-count</i>   <b>timeout</b> <i>timeout-msec</i> }	Configures the Fibre Channel port-to-port login (PLOGI).
<b>Step 9</b>	(Optional) UCS-A /org/fc-policy # <b>set recv-queue</b> { <b>count</b> <i>count</i>   <b>ring-size</b> <i>size-num</i> }	Configures the Fibre Channel receive queue.
<b>Step 10</b>	(Optional) UCS-A /org/fc-policy # <b>set scsi-io</b> { <b>count</b> <i>count</i>   <b>ring-size</b> <i>size-num</i> }	Configures the Fibre Channel SCSI I/O.
<b>Step 11</b>	(Optional) UCS-A /org/fc-policy # <b>set trans-queue</b> <b>ring-size</b> <i>size-num</i> }	Configures the Fibre Channel transmit queue.
<b>Step 12</b>	UCS-A /org/fc-policy # <b>commit-buffer</b>	Commits the transaction to the system configuration.

### Example

The following example configures a Fibre Channel adapter policy and commits the transaction:

```
UCS-A# scope org /
UCS-A /org* # create fc-policy FcPolicy42
UCS-A /org/fc-policy* # set descr "This is a Fibre Channel adapter policy example."
UCS-A /org/fc-policy* # set error-recovery error-detect-timeout 2500
UCS-A /org/fc-policy* # set port max-luns 4
UCS-A /org/fc-policy* # set port-f-logi retries 250
UCS-A /org/fc-policy* # set port-p-logi timeout 5000
UCS-A /org/fc-policy* # set recv-queue count 1
UCS-A /org/fc-policy* # set scsi-io ring-size 256
UCS-A /org/fc-policy* # set trans-queue ring-size 256
UCS-A /org/fc-policy* # commit-buffer
UCS-A /org/fc-policy #
```

## Deleting a Fibre Channel Adapter Policy

### Procedure

	Command or Action	Purpose
<b>Step 1</b>	UCS-A# <b>scope org</b> <i>org-name</i>	Enters organization mode for the specified organization. To enter the root organization mode, type / as the <i>org-name</i> .

	Command or Action	Purpose
<b>Step 2</b>	UCS-A /org # <b>delete fc-policy</b> <i>policy-name</i>	Deletes the specified Fibre Channel adapter policy.
<b>Step 3</b>	UCS-A /org # <b>commit-buffer</b>	Commits the transaction to the system configuration.

### Example

The following example deletes the Fibre Channel adapter policy named FcPolicy42 and commits the transaction:

```
UCS-A# scope org /
UCS-A /org # delete fc-policy FcPolicy42
UCS-A /org* # commit-buffer
UCS-A /org #
```

## Configuring the Default vHBA Behavior Policy

### Default vHBA Behavior Policy

Default vHBA behavior policy allow you to configure how vHBAs are created for a service profile. You can choose to create vHBAs manually, or you can allow them to be created automatically.

You can configure the default vHBA behavior policy to define how vHBAs are created. This can be one of the following:

- **None**—Cisco UCS Manager does not create default vHBAs for a service profile. All vHBAs must be explicitly created.
- **HW Inherit**—If a service profile requires vHBAs and none have been explicitly defined, Cisco UCS Manager creates the required vHBAs based on the adapter installed in the server associated with the service profile.



**Note** If you do not specify a default behavior policy for vHBAs, **none** is used by default.

### Configuring a Default vHBA Behavior Policy

#### Procedure

	Command or Action	Purpose
<b>Step 1</b>	UCS-A# <b>scope org /</b>	Enters the root organization mode.
<b>Step 2</b>	UCS-A/org # <b>scope vhma-beh-policy</b>	Enters default vHBA behavior policy mode.

	Command or Action	Purpose
<b>Step 3</b>	UCS-A/org/vhba-beh-policy # <b>set action</b> { <b>hw-inherit</b> [ <b>template_name</b> <i>name</i> ]   <b>none</b> }	Specifies the default vHBA behavior policy. This can be one of the following: <ul style="list-style-type: none"> <li>• <b>hw-inherit</b>—If a service profile requires vHBAs and none have been explicitly defined, Cisco UCS Manager creates the required vHBAs based on the adapter installed in the server associated with the service profile.</li> <li>If you specify <b>hw-inherit</b>, you can also specify a vHBA template to create the vHBAs.</li> <li>• <b>none</b>—Cisco UCS Manager does not create default vHBAs for a service profile. All vHBAs must be explicitly created.</li> </ul>
<b>Step 4</b>	UCS-A/org/vhba-beh-policy # <b>commit-buffer</b>	Commits the transaction to the system configuration.

### Example

This example shows how to set the default vHBA behavior policy to **hw-inherit**.

```
UCS-A # scope org /
UCS-A/org # scope vhba-beh-policy
UCS-A/org/vhba-beh-policy # set action hw-inherit
UCS-A/org/vhba-beh-policy* # commit-buffer
UCS-A/org/vhba-beh-policy #
```

## Configuring SAN Connectivity Policies

### About the LAN and SAN Connectivity Policies

Connectivity policies determine the connections and the network communication resources between the server and the LAN or SAN on the network. These policies use pools to assign MAC addresses, WWNs, and WWPNs to servers and to identify the vNICs and vHBAs that the servers use to communicate with the network.



#### Note

We do not recommend that you use static IDs in connectivity policies, because these policies are included in service profiles and service profile templates and can be used to configure multiple servers.



## Privileges Required for LAN and SAN Connectivity Policies

Connectivity policies enable users without network or storage privileges to create and modify service profiles and service profile templates with network and storage connections. However, users must have the appropriate network and storage privileges to create connectivity policies.

### Privileges Required to Create Connectivity Policies

Connectivity policies require the same privileges as other network and storage configurations. For example, you must have at least one of the following privileges to create connectivity policies:

- admin—Can create LAN and SAN connectivity policies
- ls-server—Can create LAN and SAN connectivity policies
- ls-network—Can create LAN connectivity policies
- ls-storage—Can create SAN connectivity policies

### Privileges Required to Add Connectivity Policies to Service Profiles

After the connectivity policies have been created, a user with ls-compute privileges can include them in a service profile or service profile template. However, a user with only ls-compute privileges cannot create connectivity policies.

## Interactions between Service Profiles and Connectivity Policies

You can configure the LAN and SAN connectivity for a service profile through either of the following methods:

- LAN and SAN connectivity policies that are referenced in the service profile
- Local vNICs and vHBAs that are created in the service profile
- Local vNICs and a SAN connectivity policy
- Local vHBAs and a LAN connectivity policy

Cisco UCS maintains mutual exclusivity between connectivity policies and local vNIC and vHBA configuration in the service profile. You cannot have a combination of connectivity policies and locally created vNICs or vHBAs. When you include a LAN connectivity policy in a service profile, all existing vNIC configuration is erased, and when you include a SAN connectivity policy, all existing vHBA configuration in that service profile is erased.

## Creating a SAN Connectivity Policy

### Procedure

	Command or Action	Purpose
<b>Step 1</b>	UCS-A# <b>scope org</b> <i>org-name</i>	Enters the organization mode for the specified organization. To enter the root organization mode, enter / as the <i>org-name</i> .

	Command or Action	Purpose
<b>Step 2</b>	UCS-A /org # <b>create san-connectivity-policy</b> <i>policy-name</i>	Creates the specified SAN connectivity policy, and enters organization network control policy mode.  This name can be between 1 and 16 alphanumeric characters. You cannot use spaces or any special characters other than - (hyphen), _ (underscore), : (colon), and . (period), and you cannot change this name after the object is saved.
<b>Step 3</b>	(Optional) UCS-A /org/lan-connectivity-policy # <b>set descr</b> <i>policy-name</i>	Adds a description to the policy. We recommend that you include information about where and how the policy should be used.  Enter up to 256 characters. You can use any characters or spaces except ` (accent mark), \ (backslash), ^ (carat), " (double quote), = (equal sign), > (greater than), < (less than), or ' (single quote).
<b>Step 4</b>	UCS-A /org/service-profile # <b>set identity</b> { <b>dynamic-uuid</b> { <i>uuid</i>   <b>derived</b> }   <b>dynamic-wwnn</b> { <i>wwnn</i>   <b>derived</b> }   <b>uuid-pool</b> <i>pool-name</i>   <b>wwnn-pool</b> <i>pool-name</i> }	Specifies how the server acquires a UUID or WWNN. You can do one of the following: <ul style="list-style-type: none"> <li>• Create a unique UUID in the form <i>nnnnnnnnnn-nnnnn-nnnnn-nnnnnnnnnnnnnnn</i></li> <li>• Derive the UUID from the one burned into the hardware at manufacture</li> <li>• Use a UUID pool</li> <li>• Create a unique WWNN in the form <i>hh : hh : hh : hh : hh : hh : hh : hh</i></li> <li>• Derive the WWNN from one burned into the hardware at manufacture</li> <li>• Use a WWNN pool</li> </ul>
<b>Step 5</b>	UCS-A /org/lan-connectivity-policy # <b>commit-buffer</b>	Commits the transaction to the system configuration.

### Example

The following example shows how to create a SAN connectivity policy named SanConnect242 and commit the transaction:

```
UCS-A# scope org /
UCS-A /org* # create san-connectivity-policy SanConnect242
UCS-A /org/san-connectivity-policy* # set descr "SAN connectivity policy"
UCS-A /org/san-connectivity-policy* # set identity wwnn-pool SanPool7
```

```
UCS-A /org/san-connectivity-policy* # commit-buffer
UCS-A /org/san-connectivity-policy #
```

### What to do next

Add one or more vHBAs and/or initiator groups to this SAN connectivity policy.

## Deleting a SAN Connectivity Policy

If you delete a SAN connectivity policy that is included in a service profile, it also deletes all vHBAs from that service profile and disrupts SAN data traffic for the server associated with the service profile.

### Procedure

	Command or Action	Purpose
<b>Step 1</b>	UCS-A# <b>scope org</b> <i>org-name</i>	Enters the organization mode for the specified organization. To enter the root organization mode, enter / as the <i>org-name</i> .
<b>Step 2</b>	UCS-A /org # <b>delete san-connectivity-policy</b> <i>policy-name</i>	Deletes the specified SAN connectivity policy.
<b>Step 3</b>	UCS-A /org # <b>commit-buffer</b>	Commits the transaction to the system configuration.

### Example

The following example shows how to delete a SAN connectivity policy named SanConnect52 from the root organization and commit the transaction:

```
UCS-A# scope org /
UCS-A /org # delete san-connectivity-policy SanConnect52
UCS-A /org* # commit-buffer
UCS-A /org #
```

## Creating a vHBA for a SAN Connectivity Policy

If you are continuing from [Creating a SAN Connectivity Policy, on page 9](#), begin this procedure at Step 3.

### Procedure

	Command or Action	Purpose
<b>Step 1</b>	UCS-A# <b>scope org</b> <i>org-name</i>	Enters the organization mode for the specified organization. To enter the root organization mode, enter / as the <i>org-name</i> .
<b>Step 2</b>	UCS-A /org # <b>scope san-connectivity-policy</b> <i>policy-name</i>	Enters SAN connectivity policy mode for the specified SAN connectivity policy.

	Command or Action	Purpose
<b>Step 3</b>	UCS-A /org/san-connectivity-policy # <b>create</b> <b>vhba</b> <i>vhba-name</i> [ <b>fabric</b> { <b>a</b>   <b>b</b> }] [ <b>fc-if</b> <i>fc-if-name</i> ]	Creates a vHBA for the specified SAN connectivity policy and enters vHBA mode.  This name can be between 1 and 16 alphanumeric characters. You cannot use spaces or any special characters other than - (hyphen), _ (underscore), : (colon), and . (period), and you cannot change this name after the object is saved.
<b>Step 4</b>	UCS-A /org/san-connectivity-policy/vhba # <b>set adapter-policy</b> <i>policy-name</i>	Specifies the adapter policy to use for the vHBA.
<b>Step 5</b>	UCS-A /org/san-connectivity-policy/vhba # <b>set identity</b> { <b>dynamic-wwpn</b> { <i>wwpn</i>   <b>derived</b> }   <b>wwpn-pool</b> <i>wwn-pool-name</i> }	Specifies the WWPN for the vHBA.  You can set the storage identity using one of the following options: <ul style="list-style-type: none"> <li>• Create a unique WWPN in the form <i>hh:hh:hh:hh:hh:hh:hh:hh</i>.  You can specify a WWPN in the range from 20:00:00:00:00:00:00:00 to 20:FF:FF:FF:FF:FF:FF:FF or from 50:00:00:00:00:00:00:00 to 5F:FF:FF:FF:FF:FF:FF:FF.</li> <li>• If you want the WWPN to be compatible with Cisco MDS Fibre Channel switches, use the WWPN template <b>20:00:00:25:B5:XX:XX:XX</b>.</li> <li>• Derive the WWPN from one burned into the hardware at manufacture.</li> <li>• Assign a WWPN from a WWN pool.</li> </ul>
<b>Step 6</b>	UCS-A /org/san-connectivity-policy/vhba # <b>set max-field-size</b> <i>size-num</i>	Specifies the maximum size of the Fibre Channel frame payload (in bytes) that the vHBA supports.  Enter an integer between 256 and 2112. The default is 2048.
<b>Step 7</b>	UCS-A /org/san-connectivity-policy/vhba # <b>set order</b> { <i>order-num</i>   <b>unspecified</b> }	Specifies the PCI scan order for the vHBA.
<b>Step 8</b>	UCS-A /org/san-connectivity-policy/vhba # <b>set pers-bind</b> { <b>disabled</b>   <b>enabled</b> }	Disables or enables persistent binding to Fibre Channel targets.
<b>Step 9</b>	UCS-A /org/san-connectivity-policy/vhba # <b>set pin-group</b> <i>group-name</i>	Specifies the SAN pin group to use for the vHBA.

	Command or Action	Purpose
<b>Step 10</b>	UCS-A /org/san-connectivity-policy/vhba # <b>set qos-policy</b> <i>policy-name</i>	Specifies the QoS policy to use for the vHBA.
<b>Step 11</b>	UCS-A /org/san-connectivity-policy/vhba # <b>set stats-policy</b> <i>policy-name</i>	Specifies the statistics threshold policy to use for the vHBA.
<b>Step 12</b>	UCS-A /org/san-connectivity-policy/vhba # <b>set template-name</b> <i>policy-name</i>	Specifies the vHBA template to use for the vHBA. If you choose to use a vHBA template for the vHBA, you must still complete all of the configuration not included in the vHBA template, including Steps 4, 7, and 8.
<b>Step 13</b>	UCS-A /org/san-connectivity-policy/vhba # <b>set vcon</b> { <b>1</b>   <b>2</b>   <b>3</b>   <b>4</b>   <b>any</b> }	Assigns the vHBA to one or all virtual network interface connections.
<b>Step 14</b>	UCS-A /org/san-connectivity-policy/vhba # <b>commit-buffer</b>	Commits the transaction to the system configuration.

### Example

The following example shows how to configure a vHBA for a SAN connectivity policy named SanConnect242 and commit the transaction:

```
UCS-A# scope org /
UCS-A /org* # scope san-connectivity-policy SanConnect242
UCS-A /org/san-connectivity-policy* # create vhba vhba3 fabric a
UCS-A /org/san-connectivity-policy/vhba* # set adapter-policy AdaptPol2
UCS-A /org/san-connectivity-policy/vhba* # set identity wwpn-pool SanPool7
UCS-A /org/san-connectivity-policy/vhba* # set max-field-size 2112
UCS-A /org/san-connectivity-policy/vhba* # set order 0
UCS-A /org/san-connectivity-policy/vhba* # set pers-bind enabled
UCS-A /org/san-connectivity-policy/vhba* # set pin-group FcPinGroup12
UCS-A /org/san-connectivity-policy/vhba* # set qos-policy QosPol5
UCS-A /org/san-connectivity-policy/vhba* # set stats-policy StatsPol2
UCS-A /org/san-connectivity-policy/vhba* # set template-name SanConnPol3
UCS-A /org/san-connectivity-policy/vhba* # set vcon any
UCS-A /org/san-connectivity-policy/vhba* # commit-buffer
UCS-A /org/san-connectivity-policy/vhba #
```

### What to do next

If desired, add another vHBA or an initiator group to the SAN connectivity policy. If not, include the policy in a service profile or service profile template.

## Deleting a vHBA from a SAN Connectivity Policy

### Procedure

	Command or Action	Purpose
<b>Step 1</b>	UCS-A# <b>scope org</b> <i>org-name</i>	Enters the organization mode for the specified organization. To enter the root organization mode, enter / as the <i>org-name</i> .
<b>Step 2</b>	UCS-A /org # <b>scope san-connectivity-policy</b> <i>policy-name</i>	Enters SAN connectivity policy mode for the specified SAN connectivity policy.
<b>Step 3</b>	UCS-A /org/san-connectivity-policy # <b>delete vHBA</b> <i>vhba-name</i>	Deletes the specified vHBA from the SAN connectivity policy.
<b>Step 4</b>	UCS-A /org/san-connectivity-policy # <b>commit-buffer</b>	Commits the transaction to the system configuration.

### Example

The following example shows how to delete a vHBA named vHBA3 from a SAN connectivity policy named SanConnect242 and commit the transaction:

```
UCS-A# scope org /
UCS-A /org # scope san-connectivity-policy SanConnect242
UCS-A /org/san-connectivity-policy # delete vHBA vHBA3
UCS-A /org/san-connectivity-policy* # commit-buffer
UCS-A /org/san-connectivity-policy #
```

## Creating an Initiator Group for a SAN Connectivity Policy

If you are continuing from [Creating a SAN Connectivity Policy, on page 9](#), begin this procedure at Step 3.

### Procedure

	Command or Action	Purpose
<b>Step 1</b>	UCS-A# <b>scope org</b> <i>org-name</i>	Enters the organization mode for the specified organization. To enter the root organization mode, enter / as the <i>org-name</i> .
<b>Step 2</b>	UCS-A /org # <b>scope san-connectivity-policy</b> <i>policy-name</i>	Enters SAN connectivity policy mode for the specified SAN connectivity policy.
<b>Step 3</b>	UCS-A /org/san-connectivity-policy # <b>create initiator-group</b> <i>group-name</i> <b>fc</b>	Creates the specified initiator group for Fibre Channel zoning and enters initiator group mode.  This name can be between 1 and 16 alphanumeric characters. You cannot use spaces or any special characters other than - (hyphen), _ (underscore), : (colon), and . (period), and you

	Command or Action	Purpose
		cannot change this name after the object is saved.
<b>Step 4</b>	UCS-A /org/san-connectivity-policy/initiator-group # <b>create initiator</b> <i>vhba-name</i>	Creates the specified vHBA initiator in the initiator group.  If desired, repeat this step to add a second vHBA initiator to the group.
<b>Step 5</b>	UCS-A /org/san-connectivity-policy/initiator-group # <b>set storage-connection-policy</b> <i>policy-name</i>	Associates the specified storage connection policy with the SAN connectivity policy.  <b>Note</b> This step assumes that you want to associate an existing storage connection policy to associate with the SAN connectivity policy. If you do, continue with Step 10. If you want to create a local storage definition for this policy instead, continue with Step 6.
<b>Step 6</b>	UCS-A /org/san-connectivity-policy/initiator-group/storage-connection-def # <b>create storage-target</b> <i>wwpn</i>	Creates a storage target endpoint with the specified WWPN, and enters storage target mode.
<b>Step 7</b>	UCS-A /org/san-connectivity-policy/initiator-group/storage-connection-def # <b>set target-path</b> {a   b}	Specifies which fabric interconnect is used for communications with the target endpoint.
<b>Step 8</b>	UCS-A /org/san-connectivity-policy/initiator-group/storage-connection-def # <b>set target-vsan</b> <i>vsan</i>	Specifies which VSAN is used for communications with the target endpoint.
<b>Step 9</b>	UCS-A /org/san-connectivity-policy/initiator-group # <b>commit-buffer</b>	Commits the transaction to the system configuration.

### Example

The following example shows how to configure an initiator group named `initGroupZone1` with two initiators for a SAN connectivity policy named `SanConnect242`, configure a local storage connection policy definition named `scPolicyZone1`, and commit the transaction:

```
UCS-A# scope org /
UCS-A /org* # scope san-connectivity-policy SanConnect242
UCS-A /org/san-connectivity-policy # create initiator-group initGroupZone1 fc
UCS-A /org/san-connectivity-policy/initiator-group* # set zoning-type sist
UCS-A /org/san-connectivity-policy/initiator-group* # create initiator vhba1
UCS-A /org/san-connectivity-policy/initiator-group* # create initiator vhba2
UCS-A /org/san-connectivity-policy/initiator-group* # create storage-connection-def
scPolicyZone1
UCS-A /org/san-connectivity-policy/initiator-group/storage-connection-def* # create
storage-target
```

```

20:10:20:30:40:50:60:70
UCS-A /org/san-connectivity-policy/initiator-group/storage-connection-def/storage-target*
# set
target-path a
UCS-A /org/san-connectivity-policy/initiator-group/storage-connection-def/storage-target*
# set
target-vsan default
UCS-A /org/san-connectivity-policy/initiator-group* # commit-buffer
UCS-A /org/san-connectivity-policy/initiator-group #

```

### What to do next

If desired, add another initiator group or a vHBA to the SAN connectivity policy. If not, include the policy in a service profile or service profile template.

## Deleting an Initiator Group from a SAN Connectivity Policy

### Procedure

	Command or Action	Purpose
<b>Step 1</b>	UCS-A# <b>scope org</b> <i>org-name</i>	Enters the organization mode for the specified organization. To enter the root organization mode, enter / as the <i>org-name</i> .
<b>Step 2</b>	UCS-A /org # <b>scope san-connectivity-policy</b> <i>policy-name</i>	Enters SAN connectivity policy mode for the specified SAN connectivity policy.
<b>Step 3</b>	UCS-A /org/san-connectivity-policy # <b>delete initiator-group</b> <i>group-name</i>	Deletes the specified initiator group from the SAN connectivity policy.
<b>Step 4</b>	UCS-A /org/san-connectivity-policy # <b>commit-buffer</b>	Commits the transaction to the system configuration.

### Example

The following example shows how to delete an initiator group named initGroup3 from a SAN connectivity policy named SanConnect242 and commit the transaction:

```

UCS-A# scope org /
UCS-A /org # scope san-connectivity-policy SanConnect242
UCS-A /org/san-connectivity-policy # delete initiator-group initGroup3
UCS-A /org/san-connectivity-policy* # commit-buffer
UCS-A /org/san-connectivity-policy #

```