Managing VMAX

This chapter contains the following sections:

Summary of Steps

Step 1   Add the EMC VMAX account(s).
After adding your account, you have a populated inventory for all reports, including reports for masking views, thin pools, initiator groups, port groups, storage groups, and devices.

Step 2 Manage the needed pools, groups, devices, and views:

a) Create the thin pools.

b) Create all devices: data devices, thin devices, regular devices, and meta devices.

c) Create the initiator groups.

d) Create the storage groups.

e) Create the port groups.

f) Associate Fully Automated Storage Tiering (FAST) policies with the storage groups.

g) Add devices to the storage groups.

h) Create the masking views.

VMAX Management

In a Cisco UCS Director EMC VMAX account, you manage the following pools, groups, devices, and views:

- Thin pools—Create or delete, expand, bind or unbind, and view details

- Devices—data devices, thin devices, regular devices, BCV devices, and meta devices

- Initiator groups—Create or delete, rename, add or remove initiator, replace initiator, set override flags, and view details

- Storage groups—Create or delete, rename, add or remove device, associate/disassociate FAST policy, and view details

- Port groups—Create or delete, rename, add or remove port, and view details

- Masking views—Create or delete, rename, and view details

Thin Pools

A new thin pool requires a unique name.

The buttons on the **Thin Pools** tab provide the following actions:

Button Name	Description
Create	Creates a thin pool.
Expand	Expands a thin pool.
Bind	Binds a thin pool.
Unbind	Unbinds a thin pool.
View Details	Views detailed reports on a thin pool.
Delete	Deletes a thin pool.

Creating A Thin Pool

An EMC VMAX thin pool is a collection of data devices that provide storage capacity for thin devices.

Step 1   Click **Physical** and choose **Storage**.

Step 2   On the **Storage** pane, choose a VMAX data center.

Step 3   In the Navigation pane, click the VMAX account.

Step 4   Click the **Thin Pools** tab.

Step 5   Click **Create**.

Step 6   In the **Create Thin Pool** dialog box, enter a name in the **Thin Pool Name** field.

Step 7   Click **Submit**.

Bind a Thin Pool

Step 1   Click **Physical** and choose **Storage**.

Step 2   On the **Storage** pane, choose a VMAX data center.

Step 3   In the Navigation pane, click the VMAX account.

Step 4   Click the **Thin Pools** tab.

Step 5   Click **Bind**.

Step 6   In the **Bind Symmetrix Device** dialog box, do the following:

Step 7

Name	Description
Select Thin Devices select list	Select thin devices from the pop up. Use the check box to the left.
Pre Allocate All check box	Pre-allocates all thin devices.
Capacity Type field	Select the capacity unit in GB, MB, or Cylinder. **Note** Only visible if Pre Allocate All is not checked.
Pre Allocate Size field	The pre-allocation size in GB, MB, or Cylinders. **Note** Only visible if Pre Allocate All is not checked. **Note** The Pre Allocate Size option is not available for Symmetric CLI version 8.0, it is only available for version 7.6.1.0.

Step 8   Click **Submit**.

Unbind a Thin Pool

Step 1   Click **Physical** and choose **Storage**.

Step 2   On the **Storage** pane, choose a VMAX data center.

Step 3   In the Navigation pane, click the VMAX account.

Step 4   Click the **Thin Pools** tab.

Step 5   Click **UnBind**.

Step 6   In the **UnBind Thin Device from Thin Pool** dialog box, do the following:

Step 7

Name	Description
Select Thin Devices select list	Select thin devices from the pop up. Use the check box to the left.
Force check box	Forces unbinding of selected thin devices.

Step 8   Click **Submit**.

Thin Devices

The maximum size of a VMAX thin device (TDEV) is approximately 240 GB.

Note   If you want to create a TDEV greater than this size, combine TDEVs to form a meta device. Each TDEV can be part of only one meta device.

The buttons on the **Thin Devices** tab provide the following actions:

Button Name	Description
Create	Creates a thin device.
Delete	Deletes a thin device.
View Details	Views detailed reports on a thin device.

There is no rename action for a TDEV. The device name is unique and remains the same even if the TDEV becomes a meta device and vice versa.

Creating a Thin Device

Step 1   Choose **Physical > Storage**.

Step 2   On the **Storage** pane, choose a VMAX system.

Step 3   In the Navigation pane, click the VMAX account.

Step 4   Click the **Thin Devices** tab.

Step 5   Click **Create**.

Step 6   In the **Create Thin Device** dialog box, complete the following fields:

Step 7

Name	Description
Device Count field	The thin device count.
Emulation drop-down list	Choose the emulation type for the thin device.
Capacity Type field	Select GB, MB, or cylinder.
Capacity field	Number of GB, MB, or Cylinders.

Step 8   Click **Submit**.

What to Do Next

You can select a device and click **View Details** to see the drill-down report.

BCV Devices

The buttons on the **BCV Devices** tab provide the following actions:

Button Name	Description
Create	Creates a BCV device.
Delete	Deletes a BCV device.

Creating a BCV Device

Step 1	Choose **Physical > Storage**.
Step 2	On the **Storage** pane, choose a VMAX system.
Step 3	In the Navigation pane, click the VMAX account.
Step 4	Click the **BCV Devices** tab.
Step 5	Click **Create**.
Step 6	In the **Create BCV Device** dialog box, complete the following fields:
Step 7	

Name	Description
Device Count field	The BCV device count.
Emulation drop-down list	Choose the emulation type for the BCV device.
Configuration drop-down list	Choose the configuration for the BCV device.
Capacity Type field	Select GB, MB, or cylinder.
Capacity field	Number of GB, MB, or Cylinders.

Step 8	Click **Submit**.

Data Devices

The buttons on the **Data Devices** tab provide the following actions:

Button Name	Description
Create	Creates a data device. **Note:** This action applies to VMAX only.
Delete	Deletes a data device. **Note:** This action applies to VMAX only.
View Details	Views detailed reports on a data device. **Note:** This action applies to VMAX only.

Creating a Data Device

Step 1 Click **Physical** and choose **Storage**.

Step 2 On the **Storage** pane, choose a VMAX system.

Step 3 In the Navigation pane, click the VMAX account.

Step 4 Click the **Data Devices** tab.

Step 5 Click **Create**.

Step 6 In the **Create Data Device** dialog box, complete the following fields:

Step 7

Name	Description
Device Count field	The data device count.
Disk Group field	The disk group name.
Emulation drop-down list	Choose the emulation type for the data device.
Configuration field	Choose the configuration for the data device.
Capacity Type field	Select the capacity unit in GB, MB, or Cylinder.
Capacity field	The capacity in GB, MB, or Cylinders.

Step 8 Click **Submit**.

What to Do Next

You can select a device and click **View Details** to see the drill-down report.

Regular Devices

The maximum size of a VMAX regular device is approximately 240 GB.

Note If you want to create a regular device greater than this size, combine regular devices to form a meta device. Each regular device can be part of only one meta device.

The buttons on the **Regular Devices** tab provide the following actions:

Button Name	Description
Create	Creates a regular device.

Button Name	Description
Delete	Deletes a regular device.
View Details	Views detailed reports on a regular device.

There is no rename action for a regular device. The device name is unique and remains the same even if the regular device becomes a meta device and vice versa.

Creating a Regular Device

Step 1   Choose **Physical > Storage**.

Step 2   On the **Storage** pane, choose a VMAX system.

Step 3   In the Navigation pane, click the VMAX account.

Step 4   Click the **Regular Devices** tab.

Step 5   Click **Create**.

Step 6   In the **Create Regular Device** dialog box, complete the following fields:

Step 7

Name	Description
Device Count field	The regular device count.
Disk Group select button	Select the Disk Group
Emulation drop-down list	Choose the emulation type for the regular device.
Configuration drop-down	Choose the configuration.
Capacity Type field	Select GB, MB, or cylinder.
Capacity	Number of GB, MB, or Cylinders.

Step 8   Click **Submit**.

What to Do Next

You can select a device and click **View Details** to see the drill-down report.

Meta Devices

A meta device enables you to aggregate thin devices or regular devices to increase the device size.

You can create a meta device with a thin device as the head and create other thin devices as members, or you can create a meta device with a regular device as the head and create other regular devices as members. The total meta device size is the combination of the head size and all the member device sizes.

Note There is no delete action for a meta device. Removing the members from a meta device results in a thin device.

The buttons on the **Meta Devices** tab provides the following actions:

Button Name	Description
Create Meta	Creates a new meta device.
Add Device to Meta	Adds a device to meta.
Remove Device from Meta	Removes a device from meta.
Dissolve	Disolves the selected meta.
View Details	Views detailed reports on a meta member device.

Creating a Meta Device

Step 1 Choose **Physical > Storage**.

Step 2 On the **Storage** pane, choose a VMAX system.

Step 3 In the Navigation pane, click the VMAX account.

Step 4 Click the **Meta Devices** tab.

Step 5 Click **Create Meta**.

Step 6 In the **Create Meta Device** dialog box, complete the following fields:

Step 7

Name	Description
Select Device Type drop-down list	Click **Select** Thin Device, Regular Device, BCV+TDEV, or BCV+R.
Select Thin Device select button	Visible when Thin Device is selected. Select device from list.
Select Regular Device select button	Visible when Regular Device is selected. Select device from list.
Select BCV Thin Device select button	Visible when BCV+TDV is selected. Select device from list.
Select BCV Regular Device select button	Visible when BCV+R is selected. Select device from list.
Select Meta Type drop-down list	Select the meta type

Name	Description
Select Member Device(s) select button	Click **Select**. In the **Select** dialog box, choose the device or devices by clicking in the associated check box, and click **Select**.

Step 8   In the **Create Meta Device** dialog box, click **Submit**.

Adding a Device to Meta

Step 1   Choose **Physical > Storage** .

Step 2   On the **Storage** pane, choose a VMAX system.

Step 3   In the Navigation pane, click the VMAX account.

Step 4   Click the **Meta Devices** tab.

Step 5   Choose a device from the **Device Name** column.

Step 6   Click **Add Device to Meta**.

Step 7   In the **Add Device to Meta** dialog box, complete the following fields:

Step 8

Name	Description
Select Member Device(s) pop-up list	Choose a member device to be added to the meta device.

Step 9   Click **Submit**.

Removing a Meta Device

Step 1	Choose **Physical > Storage** .
Step 2	On the **Storage** pane, choose a VMAX system.
Step 3	In the Navigation pane, click the VMAX account.
Step 4	Click the **Meta Devices** tab.
Step 5	Choose a device from the **Device Name** column.
Step 6	Click **Remove Device from Meta**.
Step 7	In the **Remove Device from Meta** dialog box, complete the following fields:
Step 8	

Name	Description
Select Member Device(s) drop-down list	Choose a member device to be removed from the meta device.

Step 9	Click **Submit**.

Dissolving a Meta Device

Step 1	Choose **Physical > Storage**.
Step 2	On the **Storage** pane, choose the VMAX system.
Step 3	In the Navigation pane, click the VMAX account.
Step 4	Click the **Meta Devices** tab.
Step 5	Choose a device from the **Device Name** column.
Step 6	Click **Dissolve**.
Step 7	Click **Submit** to dissolve the meta device.

Meta Member Devices

A meta member device (also referred to as a Meta LUN) is a LUN that is composed of several elements (LUNs). Meta member devices are similar to private LUNs. A meta member device is used by the system and is not available directly to any host. For example, you cannot place a meta member device into a storage group. There are two types of meta member devices:

- Concatenated Meta LUN—Creates a larger LUN from smaller LUNs and when performance is not a high priority.

- Striped Meta LUN—Creates a higher performance LUN (for example, when working with a large file system for a database).

Note The **Add Member to Meta** dialog box is modified to include two additional inputs if the selected meta head configuration is striped.

1 Protect - Check Box
2 BCV Device - Tabular popup with list of available BCV devices

Adding a Device to Meta (Striped Configuration)

Step 1 Choose **Physical > Storage** .

Step 2 On the **Storage** pane, choose a VMAX system.

Step 3 In the Navigation pane, click the VMAX account.

Step 4 Click the **Meta Devices** tab.

Step 5 Choose a device from the **Device Name** column.

Step 6 Click **Add Device to Meta**.

Step 7 In the **Add Device to Meta** dialog box, complete the following fields:

Step 8

Name	Description
Select Member Device(s) pop-up list	Choose a member device(s) to be added to the meta device.
Protect Data check box	If the Protect Data option is enabled, select the BCV Meta device from the tabular pop-up.
Select BCV Meta Device pop-up list	Select a BCV Meta device head node from the tabular pop-up.

Step 9 Click **Submit**.

Initiator Groups

A VMAX initiator group is a collection of host bus adapters (HBAs) that work together. Initiator groups that contain other initiator groups are considered cascaded initiator groups.

You can add, replace, or remove host initiators for an initiator group.

A new initiator group requires the following parameters:

- Initiator group type

- Initiator group name

- Initiator type

- Initiator name

- Consistent LUN (on/off)

The buttons on the **Initiator Groups** tab provide the following actions:

Button Name	Description
Create	Creates an initiator group.
Rename	Renames an initiator group.
Delete	Deletes an initiator group.
Add Initiator	Adds a host initiator.
Replace Initiator	Replaces a host initiator.
Remove Initiator	Removes a host initiator.
Override Flags	Overrides flags for volume set addressing, common serial numbers, disabling Q rest on UA, SPC2 protocol versions, environment set, AS400s, avoid reset broadcast, opening VMS, SSCI support1, and SCS13.
View Details	Views detailed reports on an initiator group.

Creating an Initiator Group

Step 1 Choose **Physical > Storage** .

Step 2 Choose the pod that contains the VMAX Solution Enabler account.

Step 3 In the Navigation pane, click the VMAX account.

Step 4 Click the **Initiator Group** tab.

Step 5 Click **Create**.

Step 6 In the **Create Initiator Group** dialog box, complete the following fields:

Step 7

Name	Description
Initiator Group Type drop-down list	Choose **Standard** or **Cascaded**. **Standard** is the default initiator group type. If you chose **Cascaded**, continue to Step 10.
Initiator Group Name field	The initiator group name.

Name	Description
Initiator Type drop-down list	Choose **iSCSI** or **FCP**. **iSCSI** is the default initiator type.
Initiator Name field	The initiator name.
Consistent LUN check box	Check this check box if you want to use a consistent LUN. Unchecked is the default.

Step 8   For a cascaded initiator group, complete the following fields:

Name	Description
Select Parent Initiator Group select button	Select a parent initiator group from the pop-up.
Select Child Initiator Group select button	Select child initiator group from the pop-up.

Step 9   Click **Submit**.

Storage Tiers

Tiered storage allows you to assign different categories of data to different types of storage media to reduce your total storage cost and maintenance.

The buttons on the **Storage Tiers** tab provides the following actions:

Button Name	Description
Create	Creates a storage tier.
Modify	Modifies a storage tier.
Add Thin Pool	Adds a thin pool to a storage tier.
Remove Thin Pool	Removes a thin pool from a storage tier.
Add Disk Group	Adds a disk group to a storage tier.
Remove Disk Groups	Removes disk groups from a storage tier.
Rename	Renames a storage tier.
Delete	Deletes a storage tier.
View Details	Views the details of a storage tier.

Creating a Storage Tier

Step 1   Choose **Physical > Storage**.

Step 2   Select the pod that contains the VMAX Solution Enabler account.

Step 3   In the Navigation pane, click the VMAX account.

Step 4   Click the **Storage Tiers** tab.

Step 5   Click **Create**.

Step 6   In the **Create Storage Tier** dialog box, complete the following fields:

Name	Description
Storage Tier Name field	Enter a name for the storage tier.
Storage Tier Type drop-down list	Choose **Disk Group Provisioned** or **Virtual Provisioned**.
Include Type drop-down list	Choose **Static** or **Dynamic**.
Configuration Type drop-down list	Choose **RAID-1**, **RAID-5 (3+1)**, **RAID-5 (7+1)**, **RAID-6(6+2)**, or **RAID-6(14+2)**.
Select Technology drop-down list	Choose **EFD**, **FC**, or **SATA**.
Select Disk Group pop-up	Choose a disk group from the list.
Bind to Thin Pool pop-up	Only available when Virtual Provisioned option is selected in Storage Tier Type. Select from list.
Externally Provisioned check box	Only available when Virtual Provisioned option is selected in Storage Tier Type. Check box if an externally provisioned Storage Tier is needed.

Step 7   Click **Submit**.

Modifying a Storage Tier

Step 1	Choose **Physical > Storage**.
Step 2	Select the pod that contains the VMAX Solution Enabler account.
Step 3	In the Navigation pane, click the VMAX account.
Step 4	Click the **Storage Tiers** tab.
Step 5	Choose a storage tier.
Step 6	Click **Modify**.
Step 7	In the **Modify Storage Tier** dialog box, complete the following fields:

Name	Description
Select Technology drop-down list	Choose **EFD**, **FC**, or **SATA**.

Step 8	Click **Submit**.

Adding a Thin Pool

Step 1	Choose **Physical > Storage**.
Step 2	Select the pod that contains the VMAX Solution Enabler account.
Step 3	In the Navigation pane, click the VMAX account.
Step 4	Click the **Storage Tiers** tab.
Step 5	Choose a storage tier.
Step 6	Click **Add Thin Pool**.
Step 7	In the **Add Thin Pool to Storage Tier** dialog box, complete the following fields:

Name	Description
Select Thin Pool pop-up	Choose a thin pool.

Step 8	Click **Submit**.

Removing a Thin Pool

Step 1	Choose **Physical > Storage**.
Step 2	Select the pod that contains the VMAX Solution Enabler account.
Step 3	In the Navigation pane, click the VMAX account.
Step 4	Click the **Storage Tiers** tab.
Step 5	Choose a storage tier.
Step 6	Click **Remove Thin Pool**.
Step 7	In the **Remove Thin Pool** dialog box, complete the following fields:

Name	Description
Select Thin Pool pop-up	Choose a thin pool to remove from the storage tier.

Step 8	Click **Submit**.

Adding a Disk Group

Step 1	Choose **Physical > Storage** .
Step 2	Select the pod that contains the VMAX Solution Enabler account.
Step 3	In the Navigation pane, click the VMAX account.
Step 4	Click the **Storage Tiers** tab.
Step 5	Choose a storage tier.
Step 6	Click **Add Disk Group**.
Step 7	In the **Add Disk Group** dialog box, complete the following fields:

Name	Description
Select Disk Group pop-up	Choose a disk group to be added to the storage tier.
Propogate check box	If checked, propagates changes to all storage tiers.

Step 8	Click **Submit**.

Renaming a Storage Tier

Step 1	Click **Physical** and choose **Storage**.
Step 2	Select the pod that contains the VMAX Solution Enabler account.
Step 3	In the Navigation pane, click the VMAX account.
Step 4	Click the **Storage Tiers** tab.
Step 5	Choose a storage tier.
Step 6	Click **Rename**.
Step 7	In the **Rename Storage Tier** dialog box, complete the following fields:

Name	Description
Enter New Name field	The new name of the storage tier.

Step 8	Click **Submit**.

Deleting a Storage Tier

Step 1	Choose **Physical > Storage**.
Step 2	Select the pod that contains the VMAX Solution Enabler account.
Step 3	Select the VMAX account.
Step 4	In the Navigation pane, click the VMAX account.
Step 5	Click the **Storage Tiers** tab.
Step 6	Choose a storage tier.
Step 7	Click **Delete**.
Step 8	In the **Delete Storage Tier** dialog box, complete the following fields:

Name	Description
Force check box	If checked, forces the deletion of the storage tier that has pools or disk groups.

Step 9	Click **Submit**.

Storage Groups

A VMAX storage group is a collection of Symmetrix logical volumes that are used by an application, a server, or a collection of servers.

Storage groups present storage to hosts and are also used for FAST policies.

In ,Cisco UCS Director you can create VMAX storage groups that are either Empty or Cascaded. A cascaded group can be contained within a masking view to present storage resources to an entire cluster.

The buttons on the **Storage Groups** tab provide the following actions:

Button Name	Description
Create	Creates a storage group. **Note**: For VMAX3, Create is modified to set the FAST setting while creating the storage group. This is applicable only for VMAX3. No impact on existing VMAX operation
Delete	Deletes a storage group.
Rename	Renames a selected storage group.
Remove Device	Removes a device from a storage group.
Add Device	Adds a new device to a selected storage group.
Associate FAST Policy	Associates a FAST policy with a selected storage group.
Disassociate FAST Policy	Disassociates a FAST policy from a selected storage group.
Reassociate FAST Policy	Reassociates a FAST policy to a selected storage group.
Modify FAST Priority	Modifies the storage group priority in a FAST Policy.
Modify FAST Settings	Modifies the FAST settings in a storage group. **Note**: VMAX3 Only
View Details	Views detailed reports on a storage group.
Remove Storage Group	Removes a Child Storage Group from a Parent Storage Group.

Creating an Empty Storage Group

Step 1   Choose **Physical > Storage**.
Step 2   On the **Storage** pane, choose a VMAX pod.
Step 3   In the Navigation pane, click the VMAX account.
Step 4   Click the **Storage Groups** tab.
Step 5   Click **Create**.
Step 6   In the **Create Storage Group** dialog box, complete the following fields:

Name	Description
Storage Group Type drop-down list	Choose the default option **Empty Storage Group**.
Storage Group Name field	The storage group name.
Note In addition to the previously mentioned fields, the following two fields are used in VMAX3.	
Storage Resource Pool	Select FAST SRP to associate to storage group.
Storage Level Objective	Select SLO to associate to storage group.

Step 7   Click **Submit**.

Creating a Cascaded Storage Group

A cascaded storage group can contain one or more child storage groups.

Step 1   Choose **Physical > Storage**.
Step 2   On the **Storage** pane, choose a VMAX pod.
Step 3   In the Navigation pane, click the VMAX account.
Step 4   Click the **Storage Groups** tab.
Step 5   Click **Create**.
Step 6   In the **Create Storage Group** dialog box, complete the following fields:

Name	Description
Storage Group Type drop-down list	Choose **Cascaded Storage Group**.
Select Parent Storage Group field	The parent storage group.

Name	Description
Child Storage Group field	The child storage group.

Step 7   Click **Submit**.

What to Do Next

Add devices and associate FAST policies to the storage group.

Deleting a Storage Group

Step 1   Choose **Physical > Storage**.

Step 2   On the **Storage** pane, choose a VMAX pod.

Step 3   In the Navigation pane, click the VMAX account.

Step 4   Click the **Storage Groups** tab.

Step 5   Select a Storage Group and click **Delete**.

Step 6   In the **Delete Storage Group** dialog box, complete the following fields:

Name	Description
Force check box	If checked, deletes the selected storage group even if it contains devices.

Step 7   Click **Submit**.

Renaming a Storage Group

Step 1   Choose **Physical > Storage**.

Step 2   On the **Storage** pane, choose a VMAX pod.

Step 3   In the Navigation pane, click the VMAX account.

Step 4   Click the **Storage Groups** tab.

Step 5   Select a Storage Group and click **Rename**.

Step 6   In the **Rename Storage Group** dialog box, complete the following fields:

Name	Description
Enter New Name field	The new name of the storage group.

Step 7 Click **Submit**.

Removing a Device from a Storage Group

Step 1 Choose **Physical > Storage** .

Step 2 On the **Storage** pane, choose a VMAX pod.

Step 3 In the Navigation pane, click the VMAX account.

Step 4 Click the **Storage Groups** tab.

Step 5 Select a Storage Group and click **Remove Device**.

Step 6 In the **Remove Device** dialog box, complete the following fields:

Name	Description
Select Devices pop-up	Choose a device to remove from the storage group.

Step 7 Click **Submit**.

Adding a Device to a Storage Group

Step 1 Choose **Physical > Storage**.

Step 2 On the **Storage** pane, choose a VMAX pod.

Step 3 In the Navigation pane, click the VMAX account.

Step 4 Click the **Storage Groups** tab.

Step 5 Select a Storage Group

Step 6 Click **Add Device**.

Step 7 In the **Add Devices to Storage Group** dialog box, complete the following fields:

Name	Description
Device Type drop-down list	To add a VMAX device, choose either Thin Device or Regular Device.
	To add a VMAX3 device, choose Thin Device. **Note:** The Regular device is not available for VMAX3.
Select Devices pop-up	Choose one or more devices to add to storage group.
Host LUN ID type in field	If the LUN ID is not specified, Host LUN ID is auto generated in HEXA.

Step 8   Click **Submit**.

Associating a FAST Policy to a Storage Group

Step 1   Choose **Physical > Storage** .

Step 2   On the **Storage** pane, choose a VMAX pod.

Step 3   In the Navigation pane, click the VMAX account.

Step 4   Click the **Storage Groups** tab.

Step 5   Click a Storage Group and then click**Associate FAST Policy**.

Step 6   In the **Associate FAST Policy to Storage Group** dialog box, complete the following fields:

Name	Description
Select FAST Policy pop-up	Choose a FAST policy to associate to a storage group.
Storage Group Priority field	The priority of the storage group. The range is from 1 to 3.

Step 7   Click **Submit**.

Disassociate a FAST Policy from a Storage Group

Step 1	Choose **Physical > Storage** .
Step 2	On the **Storage** pane, choose a VMAX pod.
Step 3	In the Navigation pane, click the VMAX account.
Step 4	Click the **Storage Groups** tab.
Step 5	Click a Storage Group associated to a FAST Policy and then click **Disassociate FAST Policy**.
Step 6	Click **Submit**.

Reassociate a FAST Policy from a Storage Group

Step 1	Choose **Physical > Storage** .
Step 2	On the **Storage** pane, choose a VMAX pod.
Step 3	In the Navigation pane, click the VMAX account.
Step 4	Click the **Storage Groups** tab.
Step 5	Click a Storage Group associated to a FAST Policy and then click **Reassociate FAST Policy**.
Step 6	In the **Reassociate FAST Policy to Storage Group** dialog box, complete the following fields:

Name	Description
Select FAST Policy pop-up	Choose a FAST policy to reassociate to a storage group.

Step 7	Click **Submit**.

Modifying a FAST Storage Group Priority

Step 1	Choose **Physical > Storage**.
Step 2	On the **Storage** pane, choose a VMAX pod.
Step 3	In the Navigation pane, click the VMAX account.
Step 4	Click the **Storage Groups** tab.
Step 5	Click a Storage Group associated to a FAST Policy and the click **Modify Fast Priority**.
Step 6	In the **Modify FAST Storage Group Priority** dialog box, complete the following fields:

Name	Description
Storage Group Priority field	Enter the priority of the storage group. The valid range is from 1 to 3.

Step 7   Click **Submit**.

Modifying FAST Settings

Step 1   Choose **Physical > Storage**.

Step 2   In the **Storage** pane, choose a VMAX pod.

Step 3   In the Navigation pane, click the VMAX3 account.

Step 4   Click the **Storage Groups** tab.

Step 5   Click a Storage Group and the click **Modify Fast Settings**.

Step 6   In the **Modify FAST Settings** dialog box, complete the following fields:

Name	Description
Storage Resource Pool	Select the SRP
Service Level Objective	Select the SLO.

Step 7   Click **Submit**.

Removing a Storage Group

Step 1   Choose **Physical > Storage** .

Step 2   On the **Storage** pane, choose a VMAX pod.

Step 3   In the Navigation pane, click the VMAX account.

Step 4   Click the **Storage Groups** tab.

Step 5   Select a Storage Group and click **Remove Storage Group**.

Step 6   In the **Remove Child Storage from Parent Storage** dialog box, complete the following fields:

Name	Description
Child Storage Group pop-up	Choose a child storage group to remove from the parent storage group.

Step 7   Click **Submit**.

Port Groups

A VMAX port group is a collection of front-end ports.

The buttons on the **Port Groups** tab provide the following actions:

Button Name	Description
Create	Creates a new port group.
Rename	Renames a port group.
Delete	Deletes a port group.
Add Port	Adds a new port to a selected group.
Remove Port	Removes a port from a group.
View Details	Views detailed reports on a selected port group.

Creating a Port Group

Step 1   Choose **Physical > Storage**.

Step 2   On the **Storage** pane, choose a VMAX pod.

Step 3   In the Navigation pane, click the VMAX account.

Step 4   Click the **Port Groups** tab.

Step 5   Click **Create**.

Step 6   In the **Create Port Group** dialog box, complete the following fields:

Name	Description
Port Group Name field	The port group name.

Name	Description
Select Port Group Name pop-up	Select port(s) to be included in Port Group. Click **Select**. Continue to Step 9.

Step 7   In the **Select Items** dialog box, select a director port for Port Group.

Step 8   Click **Select**.

Step 9   In the **Create Port Group** dialog box, click **Submit.**

Masking Views

VMAX designates three types of auto-provisioning groups: storage groups, port groups, and initiator groups. These three groups work together as a masking view.

The masking view ensures that the target initiators in an initiator group can access the target storage resources in a storage group by means of the target ports in a port group.

Masking views are also useful for making changes to how the storage is presented. Changes to groups that belong to a masking view, such as adding a device or port, are automatically reflected in the masking view.

The buttons on the **Masking Views** tab provide the following actions:

Button Name	Description
Create	Creates a masking view.
Rename	Renames a masking view.
View Details	Views detailed reports on a masking view.
Delete	Deletes a masking view.

Creating a Masking View

Before You Begin

You must create a storage group, initiator group, host LUN, and port group in the system.

You must attach devices to the storage group.

Step 1	Choose **Physical > Storage**.
Step 2	On the **Storage** pane, choose a VMAX pod.
Step 3	In the Navigation pane, click the VMAX account.
Step 4	Click the **Masking Views** tab.
Step 5	Click **Create**.
Step 6	In the **Create Masking Views** dialog box, complete the following fields:

Name	Description
Masking View Name field	The masking view name.
Select Storage Group Name pop-up	Choose the **Storage Group**.
Host LUN ID field	The host LUN ID. **Note** If a LUN ID is not specified, the **Host LUN ID** is autogenerated.
Select Initiator Group Name pop-up	Choose the **Initiator Group**.
Select Port Group Name pop-up	Choose the **Port Group**.

Step 7	Click **Submit**.

Fully Automated Storage Tiering Overview

FAST automatically moves the data to high-performance storage tiers and moves the inactive data to low-cost, but high-capacity storage tiers. Policies dictate how the performance and cost are optimized while the automation of FAST means that your storage system has no added management constraints compared with slower and more expensive systems. A FAST system always monitors and identifies the current activity levels of your data and moves the active data and inactive data to the most appropriate storage tier (according to your policy).

FAST Policies Overview

A FAST policy is a set of tier usage rules that are applied to your storage groups. A FAST policy describes up to three tiers and assigns an upper usage limit for each tier. The usage limit specifies the maximum percentage of the storage group that the FAST controller can allocate to a particular tier. Policy settings allow you to control and manage automated activity.

Creating a FAST Policy

Step 1   Choose **Physical > Storage**.

Step 2   On the **Storage** pane, choose a VMAX pod.

Step 3   In the Navigation pane, click the VMAX account.

Step 4   Click the **Fast Policies** tab.

Step 5   Click **Create**.

Step 6   In the **Create FAST Policy** dialog box, complete the following fields:

Name	Description
Fast Policy Name field	The FAST policy name.
Storage Tier Name pop-up	Choose a storage tier.
Max Storage Group Capacity of Tier (%) field	The upper limit of space allowed for a tier in a policy as a percentage of total storage group capacity. The valid range is from 1 to 100.

Step 7   Click **Submit**.

Adding Storage Tiers

Step 1   Choose **Physical > Storage**.

Step 2   On the **Storage** pane, choose a VMAX pod.

Step 3   In the Navigation pane, click the VMAX account.

Step 4   Click the **FAST Policies** tab.

Step 5   Select a **FAST Policy**.

Step 6   Click **Add Storage Tiers**.

Step 7   In the **Add Storage Tiers to Fast Policy** dialog box, complete the following fields:

Name	Description
Select Storage Tier pop-up	Choose a storage tier.
Max Storage Group Capacity of Tier (%) field	The upper limit of space allowed for a tier in a policy as a percentage of total storage group capacity. The valid range is from 1 to 100.

Step 8   Click **Submit**.

Removing Storage Tiers from a FAST Policy

Step 1 Choose **Physical > Storage**.

Step 2 On the **Storage** pane, choose a VMAX pod.

Step 3 In the Navigation pane, click the VMAX account.

Step 4 Click the **FAST Policies** tab.

Step 5 Select a **FAST Policy**.

Step 6 Click **Remove Storage Tiers**.

Step 7 In the **Remove Storage Tiers From Fast Policy** dialog box, select the following button:

Name	Description
Select Storage Tier button	Removes a storage tier from the FAST policy.

Step 8 Click **Submit**.

Modifying Storage Tiers

Step 1 Choose **Physical > Storage**.

Step 2 On the **Storage** pane, choose a VMAX pod.

Step 3 In the Navigation pane, click the VMAX account.

Step 4 Click the **FAST Policies** tab.

Step 5 Select a **FAST Policy**.

Step 6 Click **Modify Storage Tiers**.

Step 7 In the **Modify Storeage Tiers in a Fast Policy** dialog box, complete the following fields:

Name	Description
Select Storage Tier button	Modifies a storage tier in a FAST policy.
Max Storage Group Capacity of Tier (%) field	The upper limit of space allowed for a tier in a policy as a percentage of total storage group capacity. The valid range is from 1 to 100.

Step 8 Click **Submit**.

Renaming a FAST Policy

Step 1 Choose **Physical > Storage**.

Step 2 On the **Storage** pane, choose a VMAX pod.

Step 3 Click the **Systems** tab.

Step 4 In the Navigation pane, click the VMAX account.

Step 5 Select a **FAST Policy**.

Step 6 Click **Rename**.

Step 7 In the **Rename FAST Policy** dialog box, complete the following fields:

Name	Description
Enter New Fast Policy Name field	The new FAST policy name.

Step 8 Click **Submit**.

Deleting a FAST Policy

Step 1 Choose **Physical > Storage**.

Step 2 On the **Storage** pane, choose the VMAX pod.

Step 3 In the Navigation pane, click the VMAX account.

Step 4 Click the **FAST Policies** tab.

Step 5 Select a **FAST Policy**.

Step 6 Click **Delete**.

Step 7 In the **Delete Fast Policy** dialog box, complete the following fields:

Name	Description
Force check box	If checked, deletes any policy that contains storage tiers.

Step 8 Click **Submit**.

FAST Controller Overview

FAST can be configured to operate in AUTO_APPROVE mode, where Cisco UCS Director automatically executes data movements based on the defined policy. However, it can operate in USER_APPROVE mode, where all change plans recommended must be explicitly approved prior to being executed.

Modifying FAST Controller Settings

Step 1   Click **Physical** and choose **Storage**.

Step 2   On the **Storage** pane, choose a VMAX pod.

Step 3   In the Navigation pane, click the VMAX account.

Step 4   Click the **FAST Controller** tab.

Step 5   Click **Modify FAST Controller Setting**.

Step 6   In the **Modify FAST Controller Setting** dialog box, complete the following fields:

Name	Description
Data Movement Approval Mode drop-down list	Choose **USER_APPROVE** or **AUTO APPROVE**. USER APPROVE is the default selection.
Max Simultaneous Device Moves field	The number of maximum simultaneous device moves permitted. The valid range is 2 to 32.
Max Devices Moves Per Day field	The number of maximum simultaneous device moves permitted per day. The valid range is 2 to 200.
Min Initial Workload Period (hrs) field	The minimum initial workload period (in hours). The valid range is 2 to the current value.
Workload Analysis Period (hrs) field	The workload analysis period (in hours). The valid range is 2 to 672.
Swap Not Visible Devices drop-down list	Choose **Enable** or **Disable** to not swap visible devices.
Allow Only Swap drop-down list	Choose **Enable** or **Disable** the ability to swap only devices.
FAST VP Data Movement Mode drop-down list	Choose to enable or disable (None) the FAST VP Data Movement Mode. **Auto** is the default mode.
FAST VP Data Relocation Rate field	The FAST VP Data Relocation Rate value. The valid range is 1 to 10.
Thin Pool Reserved Capacity (%) field	The Thin Pool Reserved Capacity (%)) value. The valid range is 1 to 80.

Name	Description
VP Allocation By FAST policy field	Choose the Thin Pool Reserved Capacity (%) value. The default value is Enabled.
FAST VP Time to Compress (Days) field	The FAST VP Time to Compress (Days) value. The valid range is from 40 to 400 days or never.
FAST VP Compression Rate field	The FAST VP Time to Compress (Days) value. The valid range is from 1 to 10.

Step 7 Click **Submit**.

FAST Status Overview

The **FAST Status** tab allows to you modify the FAST state of your storage tiers by choosing either the **Disk Group Provisioned** option or the **Virtual Group Provisioned** option.

Modifying the FAST State

Step 1 Choose **Physical > Storage**.

Step 2 On the **Storage** pane, choose a VMAX pod.

Step 3 In the Navigation pane, click the VMAX account.

Step 4 Click the **FAST Status** tab.

Step 5 Click **Modify FAST State**.

Step 6 In the **Modify VMAX FAST State** dialog box, complete the following fields:

Name	Description
FAST Type drop-down list	Choose **FAST Type** to change the state.
Enable check box	If checked, enables the FAST state.

Step 7 Click **Submit**.

Renaming FAST SLO

Step 1   Choose **Physical > Storage**.

Step 2   On the **Storage** pane, choose a VMAX pod.

Step 3   In the Navigation pane, click the VMAX3 account.

Step 4   Click the **FAST SLO** tab.

Step 5   Click **Rename**.

Step 6   In the **Rename FAST SLO Name** dialog box, complete the following field:

Name	Description
New SLO Name field	Type in a new SLO name.

Step 7   Click **Submit**.

VMAX Properties File

In earlier UCSD releases, when executing VMAX workflows, sometimes you will see the following error:

The SYMAPI database file is already locked by another process.

This happens when executing multiple Tasks/Actions concurrently.

To overcome this issue, you must resubmit the SR/action.

To reduce the user intervention in handling such scenarios, we have added logic to re-submit the task/action automatically. The new logic will resubmit the Task/Action the specified number of times.

These configurations can be configured in the *vmax.properties* file, available in the */opt/infra/inframgr* folder.

The *vmax.properties* file consists of following parameters:

emc.vmax.retryMessages	This parameter sets the error messages. If this error message is captured for any of the Tasks/Actions, the same Tasks/Actions will be executed.	Default Error Message: *The SYMAPI database file is already locked by another process* **Note** More than one message can be added by separating with a comma as the delimiter.
emc.vmax.maxIterationCount	This parameter specifies the maximum number of attempts to be tried if the VMAX response contains the message specified in the property mentioned above.	Default value: 20

emc.vmax.sleepTime	This parameter sets the time (in ms) the retry operation waits before it connects to the VMAX device to execute the command.	Default value: 30000 ms (30 sec)

VMAX Sym Device Inventory Collection

UCSD collects the sym device inventory for every 500 devices. This also can be configured using *vmax.properties* file.

emc.vmax.inventory.symdev.count	If VMAX inventory is configured using multi node setup. This will be useful to reduce the inventory time if VMAX has a large number of sym devices.	Default value: 500

Editing the vmax.properties File

The procedure to edit the vmax.properties file is:

Step 1   Log in to the UCSD appliance using root credentials.

Step 2   cd /opt/infra/inframgr.
This is to change the directory

Step 3   Type vi vmax.properties and enter.

Step 4   Change the desired property and save the file.
The changes will be reflected immediately.