Managing VNX Block Storage

This chapter contains the following sections:

VNX Block Storage Management

For VNX block (and VNX unified) accounts, you manage the following pools, groups, devices, and views:

- Storage pools—Name, description, RAID type (RAID 1/0, RAID-5, RAID-6), disks, and percentage of the full threshold
- RAID groups—RAID group ID, RAID Type (RAID 1, 0, 3, or 5, disk, hot spare), expansion, or defragmentation priority, disks. You have options to automatically destroy a RAID group after the last LUN is unbound, and for power saving.
- Host initiators—Add to new or existing host, hostname, WWN/IQN, SP port, initiator type (CLARiiON Open, HP Auto Trespass, HP No Auto Trespass, SGI, Fujitsu Siemens, Compaq Tru64), and failover mode (Active-Active mode -Failover Mode 4, Active-Passive mode (PNR)-Failover Mode 1, AIX Active-Passive mode (PAR)-Failover Mode 3, Legacy Failover Mode 2, Legacy Failover Mode 0). You add hosts to the storage groups.

- Storage groups—Name
- Logical unit numbers (LUNs)—Storage pool type (pool, RAID group), RAID type (1_0, 5), storage pool for new LUN (new or existing pool), user capacity, capacity units (MB, GB, TB, Blocks), alignment offset (LBA), default owner, initial tier placement (optimize for pool performance, highest available tier, lowest available tier), and options for automatically assigning LUN IDs as LUN names, LUN ID autogeneration, and Thin or Maximum provisioning. You mount LUNs as Datastores and also add them to the storage groups.

The read-only report detail includes the following information:

- **System Summary—**File system allocation and system overview summary graphs
- **Data Movers—**Unique ID, account name, server name, and role
- **Storage Processors—**SP name, serial number, IP address, and faults (on or off)
- **Disk Devices—**Unique ID, account name, name, disk type, state, capacity (GB), and other data
- **Hosts—**Account name, hostname, IP address, storage group, attached to host (on or off), number of HBA ports, log in status, and status
- **Initiators—**Account name, storage group, initiator name, log in status, SP port ID, SP port type, registered (y/n), hostname, and IP address
- **Ports—**SP port, port IP address, port WWN, port type, storage processor, and fabric WWN
- **More Reports—**Tabular report for RAID groups or hosts, and instant reports for file system allocation, as well as the top five storage capacity file systems, the top five file systems file count, and the top five storage capacity volumes

Summary of Steps

Step 1 Add the VNX block account (s).

Step 2 Create the pools, groups, hosts, and LUNs needed for block management:

a) Create the storage pools.
b) Create the RAID groups.
c) Create the host initiators.
d) Create the storage groups.
e) Create the LUNs and mount them as datastores.
f) Add hosts to the storage groups.
g) Add LUNs to the storage groups.

Step 3 Review reports.

Storage Pools

A storage pool requires the following parameters:

- Storage pool name
- Description
- RAID type—1/0, 5, or 6
- Disks
- Percent full threshold

You click buttons on the **Block Storage Pools** tab for the following actions:

Button Name	Description
Create	Creates a new storage pool.
Delete	Deletes a selected storage pool.
Expand	Expands a selected storage pool.
Assign to Group	Assigns a selected storage pool to a group.
View Details	Views details on a selected storage pool.

Creating a Storage Pool

Step 1 On the menu bar, choose **Physical > Storage**.

Step 2 On the **Storage** pane, choose the VNX pod on which you want to create a storage pool.

Step 3 Click the **Block Storage Pools** tab.

Step 4 Click **Create**.

Step 5 In the **Create Storage Pool** dialog box, complete the following fields:

Name	Description
Storage Pool Name field	The storage pool name.
Description field	The description.
RAID Type drop-down list	Choose the **RAID Type**. This can be one of the following: **1/0** **5** **8**

Name	Description
Disks field	Click **Select**. Go to Step 6.
Percent Full Threshold field	The percentage full threshold.

Step 6 In the **Select Items** dialog box, choose one of the following options:

- Check the individual items to use a subset of disks.
- **Check All** (to use all disks)
- **Check None** (to use no disks)

Step 7 Click **Select**.

Step 8 In the **Create Storage Pool** dialog box, click **Submit.**

RAID Groups

A RAID group has the following parameters:

- RAID Group ID—The system can specify or you can create a group ID
- RAID type—1/0, 5, or 6
- Option to automatically destroy after last LUN is unbound
- Expansion or defragmentation priority
- Option to allow power saving
- Disks

You click buttons on the **RAID Groups** tab for the following actions:

Button Name	Description
Create	Creates a new RAID group.
Delete	Deletes a selected RAID group.
Assign to Group	Assigns a selected RAID group to a group.
View Details	Views details about the selected RAID group.

Creating a RAID Group

Step 1 On the menu bar, choose **Physical > Storage**.

Step 2 On the **Storage** pane, choose the VNX data center where you want to create a RAID group.

Step 3 Click the **RAID Groups** tab.

Step 4 Click **Create**.

Step 5 In the **Create RAID Group** dialog box, complete the following fields:

Name	Description
RAID Group ID field	Enter the RAID group ID. This can be one of the following: **1** **0** **3** **5** **disk** **hot spare**
RAID Type drop-down list	Choose the RAID type. This can be one of the following: **RAID0** **RAID1** **RAID1/0** **RAID3** **RAID5** **RAID6** **DISK**
Allow Power Saving check box	If checked, the system allows power saving for this RAID group.
Disks field	Click **Select**. Go to Step 6.

Step 6 In the **Select Items** dialog box, choose one of the following options:

- Check the individual items to use a subset of disks.

- Check the box next to Account Name to select all of the disks. Uncheck the box to Deselct all of the disks.

Step 7 Click **Select**.

Step 8 In the **Create RAID Group** dialog box, click **Submit.**

Host Initiators

A host initiator requires the following parameters:

- Add initiator to—You can add an initiator to a new or existing host
- Host
- WWN/IQN
- SP port
- Initiator type
- Failover mode

You click buttons on the **Initiators** tab for the following actions:

Button Name	Description
Register	Registers a new initiator.
View Details	Views details about the selected initiator.
Deregister	Deregisters a selected initiator.

Registering a Host Initiator

Step 1 On the menu bar, choose **Physical > Storage**.

Step 2 On the **Storage** pane, choose the VNX data center where you want to register a host initiator.

Step 3 Click the **Initiators** tab.

Step 4 Click **Register**.

Step 5 In the **Register Host Initiator** dialog box, complete the following fields:

Name	Description
Add Initiator to drop-down list	Choose either **Existing Host** or **New Host**. If you chose **New Host**, go to Step 6.

Name	Description
Host field	If you chose **Existing Host**, click **Select**. Go to Step 7.
WWN/IQN	The WWN/IQN for the new or existing host.
SP Port field	Click **Select.** Go to Step 8.
Initiator Type drop-down list	Choose the **Initiator Type**. This can be one of the following: • CLARiiON Open • HP Auto Trespass • HP No Auto Trespass • SGI • Fujitsu Siemens • Compaq Tru64
Failover Mode drop-down list	Choose the **Failover Mode**. This can be one of the following: • Active-Active mode-Failover Mode 4 • Active-Passive mode (PNR)-Failover Mode 1 • AIX Active-Passive mode (PAR)-Failover Mode 3 • Legacy Failover Mode 2 • Legacy Failover Mode 0

Step 6 In the same dialog box, to add the initiator to a new host, complete the following fields:

Name	Description
Host Name field	The hostname of the new host.
IP Address field	The IP address of the new host.

Step 7 In the **Select** dialog box, to add the initiator to an existing host, choose one of the hosts, and click **Select**.

Step 8 In the **Select** dialog box, choose one of the **SP Ports** in the list, and click **Select**.

Step 9 In the **Register Host Initiator** dialog box, click **Submit.**

Storage Groups

A storage group requires a name as a parameter.

You click buttons on the **Storage Groups** tab for the following actions:

Button Name	Description
Create	Creates a new storage group.
View Details	Views details about the selected storage group.
Delete	Deletes a selected storage group.
Add LUN	Adds a LUN to a selected storage group.
Remove LUN	Removes a LUN from a selected storage group.
Add Host	Adds a host to a selected storage group.
Remove Host	Removes a host from a selected storage group.

Creating a Storage Group

Step 1 On the menu bar, choose **Physical > Storage**.

Step 2 On the **Storage** pane, choose the VNX data center where you want to create the storage group.

Step 3 Click the **Storage Groups** tab.

Step 4 Click **Create**.

Step 5 In the **Create Storage Group** dialog box, enter the name for the storage group in the **Name** field.

Step 6 Click **Submit.**

What to Do Next

Add hosts and LUNs to the storage group on the **Storage Groups** tab.

LUNs

A LUN has the following parameters:

- Option to automatically assign LUN IDs as LUN names
- Option to allow the system to specify the LUN ID
- Storage pool type

- RAID type
- Storage pool
- Thin or maximum provisioning
- User capacity (thin LUN only)
- Capacity units
- LUN ID
- Alignment offset (LBA)
- Default owner

You click buttons on the **LUNs** tab for the following actions:

Button Name	Description
Create	Creates a LUN.
Delete	Deletes a selected LUN.
Expand	Expands a selected LUN.
Create Meta LUN	Create a Meta LUN for a selected LUN.
Associate LUN as Datastore	Associates a LUN as a Datastore.
Assign to Group	Assigns a selected LUN to a group.
View Details	View details on a selected LUN.

Creating a LUN

- On the menu bar, choose **Physical > Storage**.
- On the **Storage** pane, choose the VNX pod where you want to create a LUN.
- Click the **LUNs** tab.
- Click **Create**.
- In the **Create LUN** dialog box, complete the following fields:

Name	Description
Storage Pool Type drop-down list	Choose the storage pool type. **Restriction** If you choose **RAID Group**, the system automatically generates the LUN ID. Automatic LUN naming ensures that the LUN name conforms to a set of strict naming conventions. An incorrectly named LUN no longer functions properly. If you choose **Pool**, the default path is set to automatically assign LUN IDs as LUN names. However, you have the option to uncheck this option (not recommended).
Automatically assign LUN IDs as LUN Names check box	If you chose **Pool** as the storage pool type, the default path is set to automatically assign LUN IDs as LUN names. However, you have the option to uncheck this option (not recommended). If checked, LUN IDs are automatically assigned as LUN names. Uncheck the check box if you do not want LUN IDs to be assigned as LUN names.
Storage Pool for New LUN drop-down list	Choose the storage pool for the new LUN.
Thin check box	Check this check box if you want a thin LUN.
Ignore Thresholds check box	Check this check box to ignore Storage Pool threshold limits.
User Capacity field	The user capacity (applies to **Thin LUN** only).
Capacity Units drop-down list	Choose the capacity units type. This can be one of the following: **GB** **MB** **TB** **Blocks**
Alignment Offset (LBA) field	The alignment offset (LBA) (0 to 9999).
Default Owner drop-down list	Choose the default owner from the drop down-list: Auto SP A SP B

Name	Description
Initial Tier Placement drop-down list	Choose one of the following from the drop-down list: Optimize for Pool Performance Highest available tier Lowest available tier

- Click **Submit.**

What to Do Next

Mount the LUN as a Datastore.

Adding a Host to a Storage Group

Before You Begin

A host and a storage group must exist in the system.

Step 1 On the menu bar, choose **Physical > Storage**.

Step 2 On the **Storage** pane, choose the VNX data center where you want to add a host.

Step 3 Click the **Storage Groups** tab.

Step 4 Click **Add Host**.

Step 5 In the **Add Host(s) to Storage Group** dialog box, complete the following fields:

Name	Description
Show Hosts drop-down list	Choose **Include Connected** or **Not Connected**.
Hosts field	Click **Select**. Go to Step 6.

Step 6 In the **Select** dialog box, choose a host.

Step 7 Click **Select**.

Step 8 In the **Add Host(s) to Storage Group** dialog box, click **Submit**.

Adding a LUN to a Storage Group

Before You Begin

A LUN and a storage group must exist in the system.

Step 1 On the menu bar, choose **Physical > Storage**.

Step 2 On the **Storage** pane, choose the VNX data center where you want to add a LUN.

Step 3 Click the **Storage Groups** tab.

Step 4 Click **Add LUN**.

Step 5 In the **Add LUN to Storage Group** dialog box, complete the following fields:

Name	Description
LUN field	If you want to choose the LUN manually, click **Select**. Go to Step 6.
Let System Specify HLU check box	If checked, the system autogenerates the Host LUN ID (HLU).

Step 6 In the **Host LUN ID** field, enter the **Host LUN ID**.

Step 7 Click **Submit**.

Creating a Meta LUN

Before You Begin

Create a LUN.

Step 1 On the menu bar, choose **Physical > Storage**.

Step 2 On the **Storage** pane, choose the VNX Pod where you want to create a Meta LUN.

Step 3 Click the **Meta LUNs** tab.

Step 4 Click **Create Meta LUN**.

Step 5 In the **Create Meta LUN** dialog box, complete the following fields:

Name	Description
Expansion Type drop-down list	Choose an expansion type. This can be one of the following: • **Stripe Expansion** • **Concatenate Expansion**
Flare LUNs drop-down list	Choose a Flare LUN that is added to the base LUN.
Meta LUN Name field	The LUN name.
MAX check box	If checked, the system creates a MAX LUN size.
User Capacity field	The LUN capacity units (applies to **Thin LUN** only).
Capacity Units drop-down list	Choose a capacity unit.
Default Owner drop-down list	Choose the default owner.
Element size Multiplier field	The element size multiplier. This field displays the strip element size multiplier for the meta LUN. The default value is 4.
Alignment Offset field	The alignment offset (LBA) value. The value range is from 0 to 9999.
Enable Auto-assign check box	If checked, the system enables **Auto-assign**. This option enables or disables Auto-assign only to a storage system that has two service providers and a LUN that is not a hot spare.
Expansion Rate drop-down list	Choose an expansion rate for making additional LUN capacity available to the host.

Step 6 Click **Submit**.

What to Do Next

Associate a LUN as a Datastore.

Associating a LUN as a Datastore

Before You Begin

Create a LUN.

Step 1 On the menu bar, choose **Physical > Storage**.

Step 2 On the **Storage** pane, choose the VNX Pod where you want to associate a LUN as a Datastore.

Step 3 Click the **LUNs** tab.

Step 4 Choose the LUN to associate as a Datastore

Step 5 Click **Associate LUN As Datastore**.

Step 6 In the **Associate LUN As Datastore** dialog box, complete the following fields:

Name	Description
Data store Name field	The Datastore.
Select Host Node field	The host node.
Initiator Type drop-down list	Choose the initiator type.
LUN Name field	The LUN name.
VDC Name drop-down list	Choose the VDC name.
Success Criteria drop-down list	Choose how to measure the association as successful from the drop-down.

Step 7 Click **Submit**.

What to Do Next

Verify that the Datastore is associated to the LUN. For example, you can choose **Virtual > Storage** and click **vCenter** (left pane) to view the related data stores.