



## EMC Unity

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## Cisco UCS Director Support for EMC Unity

Cisco UCS Director provides support for orchestration automation, management, monitoring, and reporting for supported EMC Unity storage arrays.

The summary reports for EMC Unity that you can add to your Cisco UCS Director dashboard provide a system overview, free vs used system capacity, and the available capacity of storage pools. In addition, the available reports for an EMC Unity storage array include inventory information and the current status of the following:

- Storage processors
- Disk groups
- Disks
- Storage pools
- Storage tiers
- LUNs
- Consistency groups
- Hosts
- Initiators

- iSCSI portals
- iSCSI routes
- Ethernet ports
- FC (Fibre Channel) ports
- File systems
- SMB shares
- NFS shares
- NAS servers
- Snapshot schedules
- System Tasks

## Adding an EMC Unity Account

- 
- Step 1** Choose **Administration > Physical Accounts**.
- Step 2** On the **Physical Accounts** page, click **Physical Accounts**.
- Step 3** Click **Add**.
- Step 4** On the **Add Account** screen, complete the following fields:
- a) From the **Pod** drop-down list, choose the one of the following types of pods for this account:
    - **Default Pod**
    - **Generic**
    - **Vblock**
    - **VSPEX**
  - b) From the **Category** drop-down list, choose **Storage**.
  - c) From the **Account Type** drop-down list, choose **EMC Unity**.
- Step 5** Click **Submit**.
- Step 6** On the second **Add Account** screen, complete the following fields:
- a) Enter a unique name and description for the account.
  - b) In the **Array IP** field, enter the IP address assigned to the EMC Unity storage array.
  - c) Check the **Use Credential Policy** box if you want to use a credential policy for this account rather than enter the username and password information manually.
  - d) If you checked the **Use Credential Policy** box, choose a policy from the **Credential Policy** drop-down list. You can also click **Add** and create a new credential policy for this account. See the [Cisco UCS Director Administration Guide](#).
  - e) If you did not check **Use Credential Policy**, complete the following fields:

- Enter the username and password that this account uses to access the Unity storage array. This username must be a valid account in the Unity storage array.
- **Protocol**—Choose **https** as the transport type for this account.
- **Port**—Enter the port used to access the Unity storage array. Port 443 is the default port.
- **Connection Timeout (Seconds)**—Enter the length of time in seconds that Cisco UCS Director waits to establish a connection to the Unity storage array before timing out.

The default value is 60 seconds. The valid values are from 0 to 1800. An empty field or a value of 0 is interpreted as an infinite timeout.

- **Socket Read Timeout (Seconds)**—Enter the length of time in seconds that Cisco UCS Director will wait for data from the Unity storage array before timing out.

The default value is 60 seconds. The valid values are from 0 to 1800. An empty field or a value of 0 is interpreted as an infinite timeout.

f) Enter the email address and location of the administrator or other person responsible for this account.

### Step 7

Click **Submit**.

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Cisco UCS Director tests the connection to the EMC Unity storage array. If that test is successful, it adds the Unity account and discovers all infrastructure elements in the storage array that are associated with that account. This discovery process and inventory collection cycle takes few minutes to complete.

## Storage Pools

A storage pool includes one or more drives with the same characteristics, such as the disk group, RAID type, or number of disks. An EMC Unity storage array must have at least one storage pool that you can use to create storage resources, such as LUNs and file systems.

After you create a storage pool, you can expand the pool to include additional drives and multiple drive types. However, you cannot remove drives assigned to a pool.

## Creating a Storage Pool

### Before You Begin

- Create at least one disk group on the EMC Unity storage array. All available disk groups are added to Cisco UCS Director during inventory collection.

- Make sure the disks that you want to include in the storage pool are free and available in the appropriate storage tier.

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- Step 1** Choose **Physical > Storage**.
- Step 2** On the **Storage** page, choose the pod.
- Step 3** On the **Storage** page, click **Storage Accounts**.
- Step 4** Click the row with the EMC Unity account where you want to create a storage pool and click **View Details**.
- Step 5** Click **Storage Pools**.
- Step 6** Click **Create**.
- Step 7** On the **Create Storage Pool** screen, complete the following fields:
- Enter a unique name and description for the storage pool.
  - Expand **Disk Group** and check each group that you want to use.
  - From the **RAID Type** drop-down list, choose the type of RAID configured for the drives in the pool.
  - From the **RAID Stripe Width** drop-down list, choose the number of parallel stripes that can be written to or read from simultaneously.
  - In the **Number of Disks** field, enter the number of disks in the pool.
  - In the **Alert Threshold** field, enter a number between 50 and 84 to specify when the system sends an email notification about the available pool capacity.  
The alert threshold is the percentage of allocated storage from the pool. This number determines when the system sends alerts about the amount of free space remaining in the pool. For example, if you specify 84, the system sends an alert when 84% of the storage is allocated and only 16% is available.
- Step 8** Click **Submit**.
- 

## Expanding a Storage Pool

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- Step 1** Choose **Physical > Storage**.
- Step 2** On the **Storage** page, choose the pod.
- Step 3** On the **Storage** page, click **Storage Accounts**.
- Step 4** Click the row with the EMC Unity account where you want to expand a storage pool and click **View Details**.
- Step 5** Click **Storage Pools**.
- Step 6** Click the row with the storage pool you want to expand and click **Expand**.
- Step 7** On the **Expand Storage Pool** screen, complete the following fields:
- Expand **Disk Group** and check each group that you want to add to the pool.
  - From the **RAID Type** drop-down list, choose the type of RAID configured for the drives in the pool.
  - From the **RAID Stripe Width** drop-down list, choose the number of parallel stripes that can be written to or read from simultaneously.

d) In the **Number of Disks** field, enter the number of disks that you want to add to the pool.

**Step 8** Click **Submit**.

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## Hosts

Host configurations are logical connections that hosts or applications can use to access storage resources.



**Note** Cisco UCS Director supports the Host configuration type only. We do not support the Subnet or Netgroup host configuration types.

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## Creating a Host



**Note** Cisco UCS Director supports the Host configuration type only. We do not support the Subnet or Netgroup host configuration types.

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- 
- Step 1** Choose **Physical > Storage**.
- Step 2** On the **Storage** page, choose the pod.
- Step 3** On the **Storage** page, click **Storage Accounts**.
- Step 4** Click the row with the EMC Unity account where you want to create a host and click **View Details**.
- Step 5** Click **Hosts**.
- Step 6** Click **Add**.
- Step 7** On the **Create Host** screen, complete the following fields:
- a) Enter a unique name and description for the host.
  - b) From the **Operating System** drop-down list, choose the operating system for the host.
- Step 8** Click **Submit**.
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## Adding a Network Address to a Host

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- Step 1** Choose **Physical > Storage**.
- Step 2** On the **Storage** page, choose the pod.
- Step 3** On the **Storage** page, click **Storage Accounts**.
- Step 4** Click the row with the EMC Unity account where you want to update a host and click **View Details**.
- Step 5** Click **Hosts**.
- Step 6** Click the row with the host you want to update and click **View Details**.
- Step 7** Click **Network Addresses**.
- Step 8** Choose **Create**.
- Step 9** On the **Create Host IP Port** screen, complete the following fields:
- In the **Network Address** field, enter the network address for the IP port.  
You cannot change this network address after you create the IP port.
  - Check **Ignore Port While Granting Storage Access to NFS** if you want this IP port to be ignored.
- Step 10** Click **Submit**.
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## Changing the ID for a Host LUN

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- Step 1** Choose **Physical > Storage**.
- Step 2** On the **Storage** page, choose the pod.
- Step 3** On the **Storage** page, click **Storage Accounts**.
- Step 4** Click the row with the EMC Unity account where you want to update a host and click **View Details**.
- Step 5** Click **Hosts**.
- Step 6** Click the row with the host you want to update and click **View Details**.
- Step 7** Click **Host LUNs**.
- Step 8** Click the row with the LUN that you want to modify.
- Step 9** Choose **Modify**.
- Step 10** On the **Modify LUN ID** screen, enter the new LUN ID and click **Submit**.
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## Adding an Initiator to a Host

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- Step 1** Choose **Physical > Storage**.
- Step 2** On the **Storage** page, choose the pod.
- Step 3** On the **Storage** page, click **Storage Accounts**.
- Step 4** Click the row with the EMC Unity account where you want to update a host and click **View Details**.
- Step 5** Click **Hosts**.
- Step 6** Click the row with the host you want to update and click **View Details**.
- Step 7** Click **Initiators**.
- Step 8** Choose **Add**.
- Step 9** On the **Add Host Initiator** screen, complete the following fields:
- From the **Initiator Type** drop-down list, choose either **FC** or **iSCSI**.
  - In the **iQN or WWN** field, enter the identifier for the initiator.
  - For an iSCSI initiator, if you want to use Challenge Handshake Authentication Protocol (CHAP), complete the following fields:
    - **CHAP Username**
    - **CHAP Secret**
    - **CHAP Secret Type**
  - Check **Ignore Storage Access** if you do not want to allow this initiator to have the same storage access granted to the host.
- Step 10** Click **Submit**.
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## Initiators

Initiators are the endpoints where Fibre Channel and iSCSI sessions originate. A Fibre Channel initiator is identified by its World Wide Name (WWN), and an iSCSI initiator by its iSCSI qualified name (IQN).

After you register an initiator and associate it with a host, all paths from the initiator are given access to the storage provisioned for the host. This ensures a high availability connection between the host and storage system.

## Adding a Host Initiator

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- Step 1** Choose **Physical > Storage**.
- Step 2** On the **Storage** page, choose the pod.
- Step 3** On the **Storage** page, click **Storage Accounts**.
- Step 4** Click the row with the EMC Unity account where you want to create a host and click **View Details**.
- Step 5** Click **Initiators**.
- Step 6** Click **Add**.
- Step 7** On the **Add Host Initiator** screen, complete the following fields:
- Expand **EMC Host Identity** and check the host that you want to associate with the initiator.
  - From the **Initiator Type** drop-down list, choose either **FC** or **iSCSI**.
  - In the **iQN or WWN** field, enter the identifier for the initiator.
  - For an iSCSI initiator, if you want to use Challenge Handshake Authentication Protocol (CHAP), complete the following fields:
    - **CHAP Username**
    - **CHAP Secret**
    - **CHAP Secret Type**
  - Check the **Ignore Storage Access** box, if you do not want to allow this initiator to have the same storage access granted to the host.
- Step 8** Click **Submit**.
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## iSCSI Interfaces

### Creating an iSCSI Portal

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- Step 1** Choose **Physical > Storage**.
- Step 2** On the **Storage** page, choose the pod.
- Step 3** On the **Storage** page, click **Storage Accounts**.
- Step 4** Click the row with the EMC Unity account where you want to configure an iSCSI interface and click **View Details**.
- Step 5** Click **iSCSI Portals**.
- Step 6** Click **Create**.
- Step 7** On the **Create iSCSI Portal** screen, complete the following fields:
- Expand **EMC Unity Ethernet Port** and check the port that you want to associate with the portal.



- b) Enter the IP Address, Subnet Mask or Prefix Length, VLAN ID, and Gateway Address that you want to use for the portal.

**Step 8** Click **Submit**.

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## Creating an iSCSI Route

The iSCSI route defines the destination or target node for iSCSI traffic from the iSCSI portal on the EMC Unity storage array.

### Before You Begin

Create an iSCSI portal.

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**Step 1** Choose **Physical > Storage**.

**Step 2** On the **Storage** page, choose the pod.

**Step 3** On the **Storage** page, click **Storage Accounts**.

**Step 4** Click the row with the EMC Unity account where you want to configure an iSCSI interface and click **View Details**.

**Step 5** Click **iSCSI Routes**.

**Step 6** Click **Create**.

**Step 7** On the **Create iSCSI Route** screen, complete the following fields:

- a) Expand the **EMC Unity iSCSI Portal** field, check the portal that you want to associate with the route, and click **Validate**.
- b) In the **Destination** field, enter the IP address for the target node of the route.  
The IP address can be IPv4 or IPv6.
- c) Enter the Subnet Mask or Prefix Length and Gateway Address that you want to use for the portal.

**Step 8** Click **Submit**.

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## EMC Unity Block Storage

### Setting Up EMC Unity Block Storage



**Note**

The following procedure outlines one of the ways in which you can set up EMC Unity block storage.

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**Step 1** Add an account for the EMC Unity storage array.

See [Adding an EMC Unity Account](#), on page 2.

- Step 2** Create at least one host.  
See [Creating a Host](#), on page 5.
- Step 3** Create at least one LUN.  
See [Creating a LUN](#), on page 10.
- Step 4** Map the LUN to the host that you created.  
See [Mapping a LUN to a Host](#), on page 11.
- Step 5** (Optional) Add at least one initiator to the host.  
See [Adding a Host Initiator](#), on page 8.
- Step 6** (Optional) If the host initiator type is iSCSI, do the following:
- a) Create an iSCSI Portal.  
See [Creating an iSCSI Portal](#), on page 8.
  - b) Create an iSCSI Route.  
See [Creating an iSCSI Route](#), on page 9.
- Step 7** (Optional) Create a consistency group that includes the LUN you created.  
Use consistency groups if you want to group a set of LUNs and create snapshots that represent the same point in time for each LUN. See [Creating a Consistency Group](#).
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## LUNs

You can use Cisco UCS Director to create, configure, and map LUNs for an EMC Unity storage array.

### Creating a LUN

- 
- Step 1** Choose **Physical > Storage**.
- Step 2** On the **Storage** page, choose the pod.
- Step 3** On the **Storage** page, click **Storage Accounts**.
- Step 4** Click the row with the EMC Unity account where you want to create a LUN and click **View Details**.
- Step 5** Click **LUNs**.
- Step 6** Click **Create**.
- Step 7** On the **Create LUN** screen, complete the following fields:
- a) Expand **Storage Pool**, check the storage pool you want to use for the LUN, and click **Validate**.
  - b) Enter a unique name for the LUN.
  - c) In the **Size** field, enter the quantity of storage to be allocated to the LUN.  
This value is combined with the capacity unit to determine the total allocated storage. After you create the LUN, you can only increase the size. You cannot decrease it.

- d) From the **Capacity Units** drop-down list, choose the unit of storage.  
The default capacity unit is MB.
- e) Enter a description for the LUN.
- f) Expand **Default Node** and check the node that you want to assign as the default.
- g) Check **Thin** if you want to create a thin provisioned LUN with on-demand storage instead of dedicated storage.
- h) Expand **Snapshot Schedule** and check the snapshot schedule you want to use for the LUN.
- i) Check **Pause Snapshot Schedule** if you want to pause the snapshot schedule when the LUN is created.
- j) Expand **Access Hosts**, check each host you want to be able to access the LUN, and click **Validate**.
- k) From the **Access Type** drop-down list, choose the access for the host:

- LUN
- Snapshot
- LUN and Snapshot

This field is only available after you choose and validate the host that you want to map.

- l) In the **HLU** field, enter the host LUN unit for the host.  
This field is only available after you choose and validate the host that you want to map.

**Step 8** Click **Submit**.

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## Mapping a LUN to a Host

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- Step 1** Choose **Physical > Storage**.
- Step 2** On the **Storage** page, choose the pod.
- Step 3** On the **Storage** page, click **Storage Accounts**.
- Step 4** Click the row with the EMC Unity account where you want to map a LUN and click **View Details**.
- Step 5** Click **LUNs**.
- Step 6** Click the row with the LUN that you want to map.
- Step 7** Click **Map**.
- Step 8** On the **Map LUN to Host** screen, complete the following fields:
  - a) Expand **EMC Unity Host**, check the host that you want to map, and then click **Validate**.
  - b) From the **Access Type** drop-down list, choose the access for the host:
    - LUN
    - Snapshot
    - LUN and Snapshot

This field is only available after you choose the host that you want to map.

- c) In the **HLU** field, enter the host LUN unit for the host.

This field is only available after you choose and validate the host that you want to map.

**Step 9** Click **Submit**.

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## Unmapping a LUN from a Host

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- Step 1** Choose **Physical > Storage**.
  - Step 2** On the **Storage** page, choose the pod.
  - Step 3** On the **Storage** page, click **Storage Accounts**.
  - Step 4** Click the row with the EMC Unity account where you want to unmap a LUN and click **View Details**.
  - Step 5** Click **LUNs**.
  - Step 6** Click the row with the LUN that you want to unmap.
  - Step 7** Click **Unmap**.
  - Step 8** On the **Unmap LUN from Host** screen, expand **EMC Unity Host** and check each host that you want to unmap.
  - Step 9** Click **Submit**.
- 

## Starting the Creation of a LUN Snapshot

In addition to setting a schedule to automate the creation of a snapshot, you can also take a snapshot of a LUN at any time.

- Step 1** Choose **Physical > Storage**.
  - Step 2** On the **Storage** page, choose the pod.
  - Step 3** On the **Storage** page, click **Storage Accounts**.
  - Step 4** Click the row with the EMC Unity account where you want to start a snapshot for a LUN and click **View Details**.
  - Step 5** Click **LUNs**.
  - Step 6** Click the row with the LUN where you want to create a snapshot.
  - Step 7** From the **More Actions** drop-down list, choose **Start Snapshot Creation**.
  - Step 8** On the **Start EMC Unity Snapshot Creation** screen, click **Submit**.
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## Pausing the Creation of a LUN Snapshot

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- Step 1** Choose **Physical > Storage**.
- Step 2** On the **Storage** page, choose the pod.
- Step 3** On the **Storage** page, click **Storage Accounts**.
- Step 4** Click the row with the EMC Unity account where you want to pause the snapshot creation for a LUN and click **View Details**.
- Step 5** Click **LUNs**.
- Step 6** Click the row with the LUN where you want to pause the snapshot creation.
- Step 7** From the **More Actions** drop-down list, choose **Pause Snapshot Creation**.
- Step 8** On the **Pause EMC Unity Snapshot Creation** screen, click **Submit**.
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## Consistency Groups

Consistency groups organize the storage allocated to a specific host or a set of hosts. Each consistency group can include one or more LUNs.

You can create a snapshot for a consistency group. These snapshots provide an image for each of the LUNs in the group at the same point in time. As a result, a consistency group can help to ensure that the data across all LUNs in the group is consistent.

## Creating a Consistency Group

- 
- Step 1** Choose **Physical > Storage**.
- Step 2** On the **Storage** page, choose the pod.
- Step 3** On the **Storage** page, click **Storage Accounts**.
- Step 4** Click the row with the EMC Unity account where you want to create a consistency group and click **View Details**.
- Step 5** Click **Consistency Groups**.
- Step 6** Click **Create**.
- Step 7** On the **Create Consistency Group** screen, complete the following fields:
- Enter a unique name and description for the consistency group.
  - Expand **Snapshot Schedule** and check the snapshot schedule you want to use for the consistency group.
  - Check the **Pause Snapshot Schedule** box if you want to pause the snapshot schedule.
  - Expand **LUN**, check each LUN that you want to associate with the consistency group, and click **Validate**.
  - Expand **Access Hosts**, check each host that you want to have access to the consistency group, and click **Validate**.
  - From the **Access Type** drop-down list, choose the access for the host:

- LUN

- **Snapshot**
- **LUN and Snapshot**

This field is only available after you choose and validate at least one access host.

**Step 8** Click **Submit**.

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## Adding a LUN to a Consistency Group

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- Step 1** Choose **Physical > Storage**.
- Step 2** On the **Storage** page, choose the pod.
- Step 3** On the **Storage** page, click **Storage Accounts**.
- Step 4** Click the row with the EMC Unity account where you want to update a consistency group and click **View Details**.
- Step 5** Click **Consistency Groups**.
- Step 6** Click the row for the consistency group that you want to update and click **Add LUN**.
- Step 7** On the **Add LUN to Consistency Group** screen, check the box for each LUN that you want to add and then click **Validate**.
- Step 8** Click **Submit**.
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## Removing a LUN from a Consistency Group

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- Step 1** Choose **Physical > Storage**.
- Step 2** On the **Storage** page, choose the pod.
- Step 3** On the **Storage** page, click **Storage Accounts**.
- Step 4** Click the row with the EMC Unity account where you want to update a consistency group and click **View Details**.
- Step 5** Click **Consistency Groups**.
- Step 6** Click the row for the consistency group that you want to update and click **Remove LUN**.
- Step 7** On the **Remove LUN from Consistency Group** screen, check the box for each LUN that you want to remove and then click **Validate**.
- Step 8** Click **Submit**.
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## Starting the Creation of a Consistency Group Snapshot

In addition to setting a schedule to automate the creation of a snapshot, you can also take a snapshot of a consistency group at any time.

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- Step 1** Choose **Physical > Storage**.
  - Step 2** On the **Storage** page, choose the pod.
  - Step 3** On the **Storage** page, click **Storage Accounts**.
  - Step 4** Click the row with the EMC Unity account where you want to create a snapshot of a consistency group and click **View Details**.
  - Step 5** Click **Consistency Groups**.
  - Step 6** Click the row for the consistency group where you want to take a snapshot.
  - Step 7** From the **More Actions** drop-down list, choose **Start Snapshot Creation**.
  - Step 8** On the **Start EMC Unity Snapshot Creation** screen, click **Submit**.
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## Pausing a Consistency Group Snapshot

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- Step 1** Choose **Physical > Storage**.
  - Step 2** On the **Storage** page, choose the pod.
  - Step 3** On the **Storage** page, click **Storage Accounts**.
  - Step 4** Click the row with the EMC Unity account where you want to pause a snapshot and click **View Details**.
  - Step 5** Click **Consistency Groups**.
  - Step 6** Click the row for the consistency group where you want to pause a snapshot.
  - Step 7** From the **More Actions** drop-down list, choose **Pause Snapshot Creation**.
  - Step 8** On the **Pause EMC Unity Snapshot Creation** screen, click **Submit**.
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## Deleting a Consistency Group

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- Step 1** Choose **Physical > Storage**.
- Step 2** On the **Storage** page, choose the pod.
- Step 3** On the **Storage** page, click **Storage Accounts**.
- Step 4** Click the row with the EMC Unity account where you want to delete a consistency group and click **View Details**.
- Step 5** Click **Consistency Groups**.
- Step 6** Click the row for the consistency group that you want to delete and click **Delete**.
- Step 7** On the **Delete Consistency Group** screen, complete the following fields:
- Check **Force Snap Deletion** if you want to delete all snapshots of the consistency group when you delete the consistency group.
  - Check **Force LUN Deletion** if you want to delete all LUNs associated with the consistency group when you delete the consistency group.
- Step 8** Click **Submit**.
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# EMC Unity File Storage

## Setting Up EMC Unity File Storage



**Note** The following procedure outlines one of the ways in which you can set up EMC Unity file storage.

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- Step 1** Add an account for the EMC Unity storage array.  
See [Adding an EMC Unity Account](#), on page 2.
- Step 2** Create at least one NAS Server.  
See [Creating a NAS Server](#), on page 17.
- Step 3** Create a file interface for the NAS server.  
See [Creating a File Interface for a NAS Server](#), on page 18.
- Step 4** Create one or more servers to support the NAS server.  
Make sure that these servers are consistent with the protocol that you plan to use for the file system.
- If you plan to use the SMB (Windows) file protocol, create an SMB server. If your implementation includes Active Directory, you can also create a DNS server. See [Creating an SMB Server](#), on page 18 and [Creating a DNS Server](#), on page 20.
- If you plan to use the NFS (Linux or Unix) file protocol, create an NFS server. See [Creating an NFS Server](#), on page 19.



- Step 5** Create at least one file system.  
See [Creating a File System](#), on page 21.
- Step 6** Create one or more shares for the file system.  
The shares must be consistent with the protocol you plan to use for the file system. See [Creating an SMB Share](#), on page 25 and [Creating an NFS Share](#), on page 27.
- Step 7** (Optional) Create at least one host if you want the NFS share to allow access to the host.  
See [Creating a Host](#), on page 5.
- Step 8** (Optional) Create one or more file system or directory storage quotas through user quotas or quota trees.  
See [Creating a User Quota for a File System](#), on page 23, [Creating a Quota Tree](#), on page 24, and [Creating a User Quota for a Quota Tree](#), on page 25.
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## NAS Servers

A Network-Attached Storage (NAS) server is a file server that catalogs, organizes, manages, and transfers files within the designated shares in a file storage system. A NAS server requires the following:

- Storage pool to store the server's configuration data. You can create the storage pool in Cisco UCS Director.
- Storage processor where the server runs. Cisco UCS Director imports the storage processor information from the EMC Unity storage array during inventory collection.

### Creating a NAS Server

#### Before You Begin

- Determine which storage processor you want to use for the NAS server.
- Create a storage pool.

- 
- Step 1** Choose **Physical > Storage**.
- Step 2** On the **Storage** page, choose the pod.
- Step 3** On the **Storage** page, click **Storage Accounts**.
- Step 4** Click the row with the EMC Unity account where you want to create a NAS server and click **View Details**.
- Step 5** Click **NAS Servers**.
- Step 6** Click **Create**.
- Step 7** On the **Create a NAS Server** screen, complete the following fields:
- a) Enter a unique name for the NAS server.
  - b) Expand **Storage Pool**, check the pool that you want to use, and then click **Validate**.

- c) Expand **Storage Processor**, check the processor that you want to use, and then click **Validate**.

**Step 8** Click **Submit**.

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## Creating a File Interface for a NAS Server

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**Step 1** Choose **Physical > Storage**.

**Step 2** On the **Storage** page, choose the pod.

**Step 3** On the **Storage** page, click **Storage Accounts**.

**Step 4** Click the row with the EMC Unity account where you want to update a NAS server and click **View Details**.

**Step 5** Click **NAS Servers**.

**Step 6** Click the row with the NAS server you want to update and click **View Details**.

**Step 7** Click **File Interfaces**.

**Step 8** Click **Create**.

**Step 9** On the **Create File Interface** screen, complete the following fields:

- a) Expand **IP Port**, check the box for the port that you want to use, and then click **Validate**.
- b) Enter the IP address, Subnet Mask or Prefix Length, Gateway address, and VLAN ID that you want to use for the file interface.

**Step 10** Click **Submit**.

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## Creating an SMB Server

Create an SMB server for each NAS server that you plan to use in a Windows file system.

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**Step 1** Choose **Physical > Storage**.

**Step 2** On the **Storage** page, choose the pod.

**Step 3** On the **Storage** page, click **Storage Accounts**.

**Step 4** Click the row with the EMC Unity account where you want to update a NAS server and click **View Details**.

**Step 5** Click **NAS Servers**.

**Step 6** Click the row with the NAS server where you want to create the SMB server and click **View Details**.

**Step 7** Click **SMB Servers**.

**Step 8** Click **Create**.

**Step 9** On the **Create SMB Server** screen, complete the following fields:

- a) From the **SMB Server Type** drop-down list, choose one of the following:
  - **Standalone**—This is the default option.

- **Active Directory**—Use this option if you plan to join the NAS server to an Active Directory domain.
- b) If you chose **Standalone** as the server type, complete the following fields:
- **NetBIOS Name**
  - **Description**
  - **Workgroup**
  - **Administrator Password**
- c) If you chose **Active Directory** as the server type, complete the following fields:
- **NetBIOS Name**
  - **Description**
  - **Windows Domain**
  - **Domain Administrator Name**
  - **Domain Administrator Password**
  - **Organizational Unit**

**Step 10** Click **Submit**.

---

### What to Do Next

For an SMB server with Active Directory, create a DNS server.

## Creating an NFS Server

Create an NFS server for a NAS server that you plan to use in a Linux or Unix file system.

---

- Step 1** Choose **Physical > Storage**.
- Step 2** On the **Storage** page, choose the pod.
- Step 3** On the **Storage** page, click **Storage Accounts**.
- Step 4** Click the row with the EMC Unity account where you want to update a NAS server and click **View Details**.
- Step 5** Click **NAS Servers**.
- Step 6** Click the row with the NAS server where you want to create the NFS server and click **View Details**.
- Step 7** Click **NFS Servers**.
- Step 8** Click **Create**.
- Step 9** On the **Create NFS Server** screen, check the **NFSv4 Enabled** box if you want to use NFSv4 with the NFS server.
- Step 10** Click **Submit**.
-

## Creating a DNS Server

Create a DNS server for each NAS server that you plan to use in a Windows file system and join to Active Directory.

- 
- Step 1** Choose **Physical > Storage**.
  - Step 2** On the **Storage** page, choose the pod.
  - Step 3** On the **Storage** page, click **Storage Accounts**.
  - Step 4** Click the row with the EMC Unity account where you want to update a NAS server and click **View Details**.
  - Step 5** Click **NAS Servers**.
  - Step 6** Click the row with the NAS server where you want to create the DNS server and click **View Details**.
  - Step 7** Click **DNS Servers**.
  - Step 8** Click **Create**.
  - Step 9** On the **Create DNS Server** screen, complete the following fields:
    - a) In the **Domain** field, enter the fully qualified domain name of the DNS server.
    - b) In the **IP Addresses** field, enter a prioritized list of one to three IPv4 or IPv6 addresses of DNS servers for the domain. To enter more than one IP address, separate them with commas.
  - Step 10** Click **Submit**.
- 

## Creating an NIS Server

Network Information Service (NIS) is a unix directory service. Creating an NIS Server on a NAS Server provides ability to resolve hosts defined on NFS share access lists.

- 
- Step 1** Choose **Physical > Storage**.
  - Step 2** On the **Storage** page, choose the pod.
  - Step 3** On the **Storage** page, click **Storage Accounts**.
  - Step 4** Click the row with the EMC Unity account where you want to update a NAS server and click **View Details**.
  - Step 5** Click **NAS Servers**.
  - Step 6** Click the row with the NAS server where you want to create the NIS server and click **View Details**.
  - Step 7** Click **NIS Servers**.
  - Step 8** Click **Create**.
  - Step 9** On the **Create NIS Server** screen, complete the following fields:
    - a) In the **Domain** field, enter the fully qualified domain name of the NIS server.
    - b) In the **IP Addresses** field, enter a prioritized list of one to ten IPv4 or IPv6 addresses of NIS servers for the domain. To enter more than one IP address, separate them with commas.
  - Step 10** Click **Submit**.
-

## File Systems

A file system represents a set of storage resources for network files. Users or hosts can connect to the file system and use it for file-based storage.

Each file system, or container for file-based storage, has the following properties:

- A pre-determined storage capacity
- A file access protocol, such as SMB, NFS, or multi-protocol
- One or more shares that network hosts or users can use to access shared files or folders

### Creating a File System

- 
- Step 1** Choose **Physical > Storage**.
- Step 2** On the **Storage** page, choose the pod.
- Step 3** On the **Storage** page, click **Storage Accounts**.
- Step 4** Click the row with the EMC Unity account where you want to create a file system and click **View Details**.
- Step 5** Click **File Systems**.
- Step 6** Click **Create**.
- Step 7** On the **Create File System** screen, complete the following fields:
- a) From the **Protocol** drop-down list, choose one of the following:
    - **Linux/UNIX Shares (NFS)**
    - **Windows Shares (SMB)**
  - b) Expand **NAS Server**, check the server that you want to use, and then click **Validate**.
  - c) Enter a unique name for the file system.
  - d) Expand **Storage Pool**, check the pool that you want to use, and then click **Validate**.
  - e) In the **Size** field, enter the quantity of storage to be allocated to the file system.  
This value is combined with the capacity unit to determine the total allocated storage. After you create the file system, you can only increase the size. You cannot decrease it.
  - f) From the **Capacity Units** drop-down list, choose the unit of storage.  
The default capacity unit is MB.
  - g) Check **Thin** if you want to create a thin provisioned file system with on-demand storage instead of dedicated storage.
  - h) Expand **Snapshot Schedule** and check the schedule that you want to use.
  - i) Check **Pause Snapshot Schedule** if you want to pause the snapshot schedule when the file system is created.
  - j) If you chose an SMB share for the protocol, check the **Advanced** box if you want to configure any of the following settings:

- **Sync Write Enabled**—Enables synchronous writes for all storage operations. This option guarantees that any write to the share is done synchronously and reduces the chances of data loss or file corruption. This option is recommended only if you plan to use the share as storage for a database application.
- **Opslocks Enabled**—Enables opportunistic file locking for data. This option buffers file data locally before sending it to a server. This option allows SMB clients can access the local versions of the files and communicate changes to the server periodically.
- **Notify on Write Enabled**—Enables notifications when a write is made to the file system.
- **Notify on Access Enabled**—Enables notifications when the file system is accessed.

**Step 8** Click **Submit**.

---

## Starting the Creation of a File System Snapshot

In addition to setting a schedule to automate the creation of a snapshot, you can also take a snapshot of a file system at any time.

- 
- Step 1** Choose **Physical > Storage**.
- Step 2** On the **Storage** page, choose the pod.
- Step 3** On the **Storage** page, click **Storage Accounts**.
- Step 4** Click the row with the EMC Unity account where you want to create a file system snapshot and click **View Details**.
- Step 5** Click **File Systems**.
- Step 6** Click the row with the file system where you want to create a snapshot.
- Step 7** Click **Start Snapshot Creation**.
- Step 8** On the **Start EMC Unity Snapshot Creation** screen, click **Submit**.
-

## Pausing a File System Snapshot

- 
- Step 1** Choose **Physical > Storage**.
  - Step 2** On the **Storage** page, choose the pod.
  - Step 3** On the **Storage** page, click **Storage Accounts**.
  - Step 4** Click the row with the EMC Unity account where you want to pause a file system snapshot and click **View Details**.
  - Step 5** Click **File Systems**.
  - Step 6** Click the row with the file system where you want to pause a snapshot.
  - Step 7** From the **More Actions** drop-down list, choose **Pause Snapshot Creation**.
  - Step 8** On the **Pause EMC Unity Snapshot Creation** screen, click **Submit**.
- 

## Creating a User Quota for a File System

A user quota limits or tracks the amount of storage space that individual users consume on a file system. The user quota sets default hard and soft limits at the file system level.

- 
- Step 1** Choose **Physical > Storage**.
  - Step 2** On the **Storage** page, choose the pod.
  - Step 3** On the **Storage** page, click **Storage Accounts**.
  - Step 4** Click the row with the EMC Unity account where you want to create a user quota and click **View Details**.
  - Step 5** Click **File Systems**.
  - Step 6** Click the row with the file system where you want to create the user quota and click **View Details**.
  - Step 7** Click **User Quotas**.
  - Step 8** Click **Create**.
  - Step 9** On the **Create User Quota** screen, complete the following fields:
    - a) In the **User ID** field, enter the ID of the user whose file system storage you want to limit.
    - b) In the **Soft Limit** field, enter the space usage limit where the storage usage enters the grace period.  
If you enter 0 in this field, the user has no limit on the amount of storage space available. This is the default value.
    - c) In the **Capacity Units** field, choose MB, GB, or TB as the capacity unit for the soft limit.
    - d) In the **Hard Limit** field, enter the space usage limit where the user no longer has any storage available.  
If you enter 0 in this field, the user has no limit on the amount of storage space available. This is the default value.
    - e) In the **Capacity Units** field, choose MB, GB, or TB as the capacity unit for the hard limit.
  - Step 10** Click **Submit**.
-

## Creating a Quota Tree

A quota tree limits the amount of storage that can be consumed on a particular directory. You can use a quota tree to set storage limits for a project where multiple users share the same directory or to track directory usage.

- 
- Step 1** Choose **Physical > Storage**.
- Step 2** On the **Storage** page, choose the pod.
- Step 3** On the **Storage** page, click **Storage Accounts**.
- Step 4** Click the row with the EMC Unity account where you want to create a quota tree and click **View Details**.
- Step 5** Click **File Systems**.
- Step 6** Click the row with the file system where you want to create a quota tree and click **View Details**.
- Step 7** Click **Quota Trees**.
- Step 8** Click **Create**.
- Step 9** On the **Create Tree Quota** screen, complete the following fields:
- In the **Path** field, enter the path to the directory.  
The path is relative to the root system and must start with a forward slash ("/"). For example, */sample\_path1/sample\_path2*
  - In the **Soft Limit** field, enter the space usage limit where the storage usage on the directory enters the grace period.  
If you enter 0 in this field, there is no limit to the amount of storage space available on the directory. This is the default value.
  - In the **Capacity Units** field, choose MB, GB, or TB as the capacity unit for the soft limit.
  - In the **Hard Limit** field, enter the space usage limit where the directory no longer has any storage available.  
If you enter 0 in this field, the user has no limit on the amount of storage space available. This is the default value.
  - In the **Capacity Units** field, choose MB, GB, or TB as the capacity unit for the hard limit.
- Step 10** Click **Submit**.
-



## Creating a User Quota for a Quota Tree

This user quota limits the amount of storage available to an individual user on the directory associated with the quota tree.

- 
- Step 1** Choose **Physical > Storage**.
- Step 2** On the **Storage** page, choose the pod.
- Step 3** On the **Storage** page, click **Storage Accounts**.
- Step 4** Click the row with the EMC Unity account where you want to create a user quota and click **View Details**.
- Step 5** Click **File Systems**.
- Step 6** Click the row with the file system where you want to create the user quota and click **View Details**.
- Step 7** Click **Quota Trees**.
- Step 8** Click the row with the quota tree where you want to create the user quota.
- Step 9** Click **Create User Quota**.
- Step 10** On the **Create User Quota** screen, complete the following fields:
- In the **User ID** field, enter the ID of the user whose directory storage you want to limit.
  - In the **Soft Limit** field, enter the space usage limit where the storage usage on the directory enters the grace period. If you enter 0 in this field, there is no limit to the amount of storage space available on the directory. This is the default value.
  - In the **Capacity Units** field, choose MB, GB, or TB as the capacity unit for the soft limit.
  - In the **Hard Limit** field, enter the space usage limit where the directory no longer has any storage available. If you enter 0 in this field, the user has no limit on the amount of storage space available. This is the default value.
  - In the **Capacity Units** field, choose MB, GB, or TB as the capacity unit for the hard limit.
- Step 11** Click **Submit**.
- 

## Shares

### Creating an SMB Share

An SMB share controls access to file system resources for Windows users and hosts.

### Before You Begin

Ensure that the file system or snapshot you choose for the share's source is associated with a NAS server that supports the SMB profile

- 
- Step 1** Choose **Physical > Storage**.
- Step 2** On the **Storage** page, choose the pod.
- Step 3** On the **Storage** page, click **Storage Accounts**.
- Step 4** Click the row with the EMC Unity account where you want to create an SMB share and click **View Details**.
- Step 5** Click **SMB Shares**.
- Step 6** Click **Create**.
- Step 7** On the **Create SMB Share** screen, complete the following fields:
- Expand **EMC Unity File System**, check the file system that you want to associate with the share, and then click **Validate**.
  - For the **Use Snapshot** check box, do the following:
    - To use an SMB server to create the share, do not check the box.
    - To use a snapshot to create the share, check the box.
  - If you chose to use an SMB server, expand **Select SMB Server** and check the server that you want to use.
  - If you chose to use a snapshot, expand **Select Snapshot of File System** and check the snapshot that you want to use.
  - In the **Path** field, enter the absolute path of the SMB share relative to the NAS server.  
If you do not provide a path, the share is created in the root directory.
  - Enter a description for the SMB share.
  - Check **Access-Based Enumeration** to filter the list of available files on the share and display only those to which the user has read access.
  - Check **Branch Cache Enabled** to cache content at branch offices to enable users to access the content locally.
  - Check **Protocol Encryption** to encrypt data as it is transmitted between the array and the host.
  - Check **Continuous Availability** to provide continuous access to the share after a failover of the NAS server.
  - From the **Offline Availability** drop-down list, choose one of the following options for client-side caching of offline files:
    - **Manual**—Files are cached and available offline only when caching is explicitly requested. This is the default option.
    - **Programs and files opened by users**—All files that clients open from the share are automatically cached and available offline. Clients open these files from the share when they are connected to it. This option is recommended for files with shared work.
    - **Programs and files opened by users, optimize for performance**—All files that clients open from the share are automatically cached and available offline. Clients open these files from the share's local cache, if possible, even if they are connected to the network. This option is recommended for executable programs.
    - **None**—Client-side caching of offline files is not configured.
  - In the **UMASK** field, enter the bitmask that shows which Unix permissions are excluded for files created on the share.

The default value of 022 does not allow write access from groups and other non-user entities.

**Step 8** Click **Submit**.

---

## Creating an NFS Share

An NFS share controls access to file system resources for Linux or Unix users and hosts.

### Before You Begin

Ensure that the file system or snapshot you choose for the share's source is associated with a NAS server that supports the NFS profile

---

**Step 1** Choose **Physical > Storage**.

**Step 2** On the **Storage** page, choose the pod.

**Step 3** On the **Storage** page, click **Storage Accounts**.

**Step 4** Click the row with the EMC Unity account where you want to create an NFS share and click **View Details**.

**Step 5** Click **NFS Shares**.

**Step 6** Click **Create**.

**Step 7** On the **Create NFS Share** screen, complete the following fields:

- a) Expand the **EMC Unity File System** field, check the box for the file system you want to associate with the share, and click **Validate**.
- b) Check the **Use Snapshot** box if you want to use a snapshot for the share.
- c) If you chose to use a snapshot, expand the **Select Snapshot of File System** field and check the box for the snapshot you want to use.
- d) In the **Path** field, enter the absolute path of the NFS share relative to the NAS server.  
If you do not provide a path, the share is created in the root directory.
- e) From the **Default Access** drop-down list, choose the access that you want all hosts to have.
- f) From the **Minimum Security** drop-down list, choose one of the following options:
  - **Sys**—This is the default option.
  - **Kerberos**—Uses basic Kerberos user authentication.
  - **Kerberos With Integrity**—Combines Kerberos user authentication and data integrity by adding a signature to each NFS packet transmitted over the network.
  - **Kerberos with Encryption**—Combines Kerberos user authentication and data privacy by encrypting the data before sending it over the network. Data encryption requires more resources for system processing and can lead to slower performance.
- g) To customize access for hosts, expand one or more of the following fields and check the desired hosts to configure the access privileges for the share:
  - **No Access Hosts**

- **Read Only Hosts**
- **Read Write Hosts**
- **Root Access Hosts**

**Step 8** Click **Submit**.

---

## Mapping a Host to an NFS Share

---

- Step 1** Choose **Physical > Storage**.
- Step 2** On the **Storage** page, choose the pod.
- Step 3** On the **Storage** page, click **Storage Accounts**.
- Step 4** Click the row with the EMC Unity account where you want to map an NFS share and click **View Details**.
- Step 5** Click **NFS Shares**.
- Step 6** Click **Map**.
- Step 7** On the **Map Host to NFS Share** screen, complete the following fields:
- From the **Host Access Type** drop-down list, choose the access that you want the host to have.
  - Expand **Hosts** and check each host you want to map to the share.
- Step 8** Click **Submit**.
- 

## Unmapping a Host from an NFS Share

---

- Step 1** Choose **Physical > Storage**.
- Step 2** On the **Storage** page, choose the pod.
- Step 3** On the **Storage** page, click **Storage Accounts**.
- Step 4** Click the row with the EMC Unity account where you want to unmap an NFS share and click **View Details**.
- Step 5** Click **NFS Shares**.
- Step 6** Click **Unmap**.
- Step 7** On the **Unmap Host from NFS Share** screen, complete the following fields:
- From the **Host Access Type** drop-down list, choose the access that you do not want the host to have.
  - Expand **Hosts** and check each host you want to unmap from the share.
- Step 8** Click **Submit**.
-