



Cisco UCS Director NetApp Management Guide, Release 6.9

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Preface

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Audience

This guide is intended primarily for data center administrators who use and who have responsibilities and expertise in one or more of the following:

- Server administration
- Storage administration
- Network administration
- Network security
- Virtualization and virtual machines

Conventions

Text Type	Indication
GUI elements	GUI elements such as tab titles, area names, and field labels appear in this font . Main titles such as window, dialog box, and wizard titles appear in this font .
Document titles	Document titles appear in <i>this font</i> .
TUI elements	In a Text-based User Interface, text the system displays appears in <code>this font</code> .
System output	Terminal sessions and information that the system displays appear in <code>this font</code> .

Text Type	Indication
CLI commands	CLI command keywords appear in this font . Variables in a CLI command appear in <i>this font</i> .
[]	Elements in square brackets are optional.
{x y z}	Required alternative keywords are grouped in braces and separated by vertical bars.
[x y z]	Optional alternative keywords are grouped in brackets and separated by vertical bars.
string	A nonquoted set of characters. Do not use quotation marks around the string or the string will include the quotation marks.
< >	Nonprinting characters such as passwords are in angle brackets.
[]	Default responses to system prompts are in square brackets.
!, #	An exclamation point (!) or a pound sign (#) at the beginning of a line of code indicates a comment line.



Note Means *reader take note*. Notes contain helpful suggestions or references to material not covered in the document.



Caution Means *reader be careful*. In this situation, you might perform an action that could result in equipment damage or loss of data.



Tip Means *the following information will help you solve a problem*. The tips information might not be troubleshooting or even an action, but could be useful information, similar to a Timesaver.



Timesaver Means *the described action saves time*. You can save time by performing the action described in the paragraph.



Warning IMPORTANT SAFETY INSTRUCTIONS

This warning symbol means danger. You are in a situation that could cause bodily injury. Before you work on any equipment, be aware of the hazards involved with electrical circuitry and be familiar with standard practices for preventing accidents. Use the statement number provided at the end of each warning to locate its translation in the translated safety warnings that accompanied this device.

SAVE THESE INSTRUCTIONS

Related Documentation

Cisco UCS Director Documentation Roadmap

For a complete list of Cisco UCS Director documentation, see the *Cisco UCS Director Documentation Roadmap* available at the following URL: http://www.cisco.com/en/US/docs/unified_computing/ucs/ucs-director/doc-roadmap/b_UCSDirectorDocRoadmap.html.

Cisco UCS Documentation Roadmaps

For a complete list of all B-Series documentation, see the *Cisco UCS B-Series Servers Documentation Roadmap* available at the following URL: <http://www.cisco.com/go/unifiedcomputing/b-series-doc>.

For a complete list of all C-Series documentation, see the *Cisco UCS C-Series Servers Documentation Roadmap* available at the following URL: <http://www.cisco.com/go/unifiedcomputing/c-series-doc>.

**Note**

The *Cisco UCS B-Series Servers Documentation Roadmap* includes links to documentation for Cisco UCS Manager and Cisco UCS Central. The *Cisco UCS C-Series Servers Documentation Roadmap* includes links to documentation for Cisco Integrated Management Controller.

Documentation Feedback

To provide technical feedback on this document, or to report an error or omission, please send your comments to ucs-director-docfeedback@cisco.com. We appreciate your feedback.

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Cisco Bug Search Tool

[Cisco Bug Search Tool](#) (BST) is a web-based tool that acts as a gateway to the Cisco bug tracking system that maintains a comprehensive list of defects and vulnerabilities in Cisco products and software. BST provides you with detailed defect information about your products and software.



CHAPTER 1

New and Changed Information for this Release

This chapter contains the following sections:

- [New and Changed Information in this Release, on page 1](#)

New and Changed Information in this Release

The following table provides an overview of the significant changes to this guide for this current release. The table does not provide an exhaustive list of all changes made to this guide or of all new features in this release.

Table 1: New Features and Changed Behavior in Cisco UCS Director, Release 6.9(1.0)

Feature	Description	Where Documented
Selection of a preferred API for NetApp management	The Cisco UCS Director allows you to select ZAPI or REST API for NetApp management.	Selecting an API for NetApp Management

Table 2: New Features and Changed Behavior in Cisco UCS Director, Release 6.7

Feature	Description	Where Documented
Configure Storage QOS and QOS Policy Groups added to NetApp accounts	Allows you to do the following: • Associate and configure QOS policy groups with LUNs and Volumes within the same Storage Virtual Machine (SVM) • Create and manage QOS policy groups	Monitoring and Reporting for a Cluster Mode Account, on page 71



CHAPTER 2

Overview

This chapter contains the following section:

- [About the NetApp Data Storage System, on page 3](#)
- [NetApp Accounts, on page 3](#)

About the NetApp Data Storage System

The NetApp storage systems, such as the Fabric-Attached Storage (FAS) system and the NearStore system, function as both Network Attached Storage (NAS) and Storage Area Network (SAN) storage devices that support a multiprotocol environment for data access. These devices are called Unified Storage Devices (USDs).

A NetApp unified storage system supports multiprotocol data access. It can be configured as a Fibre Channel, an Internet Small Computer System Interface (iSCSI) SAN, and a NAS device simultaneously. The NetApp storage system supports storage objects such as aggregates, volumes, logical unit numbers (LUNs), Qtrees, and so on, and provides open interfaces such as Data ONTAP APIs, SNMP, SMI-S agent that enables you to monitor and manage various components of the NetApp storage system.

NetApp open interfaces are used for unified storage capacity management. These interfaces simplify the capacity management of the NetApp storage systems when multiple protocols are supported and multiple objects are being managed. The NetApp storage systems export data as files through two primary protocols: Network File System (NFS) and Common Internet File System (CIFS). Also, the storage system exports data as blocks through the Fibre Channel Protocol (FCP) or iSCSI, and operate as SAN-attached disk arrays.

For more information, see your NetApp documentation.

NetApp Accounts

Cisco UCS Director supports the following types of NetApp accounts.

NetApp OnCommand

OnCommand manages and monitors all NetApp appliances (filers and NetCache appliances) within a network, by accessing global and detailed status reports of current and past activities. Cisco UCS Director discovers all storage elements in the NetApp account, such as aggregates, raid groups, disks, volumes, LUNs, Qtrees, and so on. Typically, the discovery process takes about 5 minutes or within the time interval that you configured in System Tasks.

NetApp Data ONTAP

Data ONTAP is an operating system used by the NetApp filer. Data ONTAP has two modes:

- **Cluster mode**—An architecture that is composed of a group of connected NetApp storage controllers (nodes) that share a global namespace (GNS). The physical NetApp storage controllers can have attached disk shelves, network interface cards (NICs), and flash cards. These components create a physical resource pool that is virtualized as a logical cluster to provide data access. Cisco UCS Director abstracts and virtualizes the physical equipment into logical resources, which allows data operations to be moved in a nondisruptive way. Cluster administrators can administer the entire cluster and the SVMs within the cluster.
- **Storage Virtual Machines (SVMs)**—An SVM (formerly known as a Vserver) is a secure virtual storage server that supports multiple protocols and unified storage. Each SVM is configured for client and host access protocols, such as iSCSI. Each SVM contains at least one volume and at least one logical interface. SVMs provide data access to clients without regard to physical storage or controller, similar to any storage system.

Depending upon the permissions and capabilities assigned by the cluster administrator, an SVM administrator can manage SVMs and their resources, including volumes, protocols, and services.



CHAPTER 3

Managing NetApp Accounts

This chapter contains the following sections:

- [NetApp Storage System Management, on page 5](#)
- [Adding a Pod, on page 5](#)
- [Adding a NetApp Account, on page 7](#)
- [Testing the Connection to a NetApp Account, on page 9](#)
- [Verifying the Discovery of a NetApp Account, on page 9](#)
- [Requirements for Adding SVMs to Cisco UCS Director, on page 10](#)
- [Adding SVMs Directly to Cisco UCS Director, on page 10](#)

NetApp Storage System Management

Cisco UCS Director supports the NetApp storage infrastructure. Cisco UCS Director provides auto-discovery, monitoring, and complete visibility for all NetApp filer components, such as nodes, SVMs, IPspaces, aggregates, and SnapMirrors.



Note You can view the model of a managed NetApp storage system, such as whether the system is FAS or AFF. The **Model** and **Storage Array Type** information is available on several NetApp reports, including the Cluster Summary report, the Nodes report, and the Nodes Summary report.

The reports in Cisco UCS Director enable you to view and identify all NetApp storage systems; for example, a report for a NetApp storage system lists information about the name, type, server IP address, version, model, and storage array type of that managed system.

To manage a NetApp storage system, you need to add a pod and create a NetApp account within that pod.

Adding a Pod

A pod is a logical grouping of physical and virtual components, including one or more physical or virtual accounts, such as an HP account for computing or a NetApp ONTAP account for storage. Typically, a pod represents a single converged infrastructure stack, such as a FlexPod, Vblock, or VSPEX.

Procedure

- Step 1** Choose **Administration > Physical Accounts**.
- Step 2** On the **Physical Accounts** page, click **Pods**.
- Step 3** Click **Add**.
- Step 4** On the **Add POD** screen, complete the following fields:

Name	Description
Name field	A descriptive name for the pod.
Type drop-down list	Choose the type of pod that you want to add. This can be one of the following supported types: • VersaStack • Virtual SAN Pod • ExpressPod Medium • FlexPod • ExpressPod Small • VSPEX • HyperFlex • Generic • Vblock A generic pod does not require a specific pod license. You can add any type of physical or virtual component to a generic pod. If you choose any type of pod except the generic type, you must have a license for that pod type. In addition, the non-generic pod types accommodate only specific physical and virtual components. For more information about pod licenses, see Cisco UCS Director Install and Upgrade Guides.
Site drop-down list	Choose the site where you want to add the pod. If your environment does not include sites, you can omit this step.
Description field	(Optional) A description of the pod.
Address field	The physical location of the pod. For example, this field could include the city or other internal identification used for the pod.
Hide POD check box	Check this box to hide the pod if you do not want it to display in the Converged Check View. You can continue to add or delete accounts from the pod. For example, you can use this check box to ensure that a pod that does not have any physical or virtual elements is not displayed in the Converged Check View.

Step 5 Click **Add**.

What to do next

Add one or more accounts to the pod.

Adding a NetApp Account

Before you begin

- Cisco UCS Director uses the Transport Layer Security (TLS) protocol to discover a NetApp device. In NetApp devices, set the TLS option to ON by entering the command: **options tls.enable on**. This setting enables Cisco UCS Director to discover NetApp accounts.
- If you do not want to use the Default Pod, create a pod for this NetApp account.
- Manually configure an aggregate on the ONTAP filer before you can use the filer management of Cisco UCS Director.

Procedure

- 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:

Name	Description
Pod drop-down list	Choose the pod to which this account belongs. Allowed pod types are Default Pod , Flex , and Generic .
Category drop-down list	Choose Storage . This is the type of infrastructure for the account.
Account Type drop-down list	Choose one of the following account types that you want to use for this account: • NetApp ONTAP • NetApp OnCommand

- Step 5** Click **Submit**.
- Step 6** On the second **Add Account** screen, complete the following fields:

Name	Description
Account Name field	A unique name that you assign to this account.

Name	Description
Server Address field	The IP address of the NetApp server. For a cluster configuration, this is the virtual IP address. For an SVM account, this is the IP address of the SVM.
Use Credential Policy check box	Check this box if you want to use a credential policy for this account rather than enter the username and password information manually.
Credential Policy drop-down list	If you checked the Use Credential Policy check box, choose the credential policy that you want to use from this drop-down list. This field is displayed only if you choose to use a credential policy.
User ID field	The username that this account will use to access the NetApp server. This username must be a valid account in the NetApp server. This field is not displayed if you chose to use a credential policy.
Password field	The password associated with the username. This field is not displayed if you chose to use a credential policy.
Transport Type drop-down list	Choose one of the following transport types that you want to use for this account: • http • https
Port field	The port used to access the NetApp account.
Connection Time Out (Seconds) field	The length of time in seconds that Cisco UCS Director will wait to establish a connection to the NetApp device before timing out. The valid values are from 0 to 1800. An empty field or a value of 0 is interpreted as an infinite time out.
Description field	(Optional) A description of this account.
Contact Email field	(Optional) The email address that you can use to contact the administrator or other person responsible for this account.
Location field	(Optional) The location of this account, if any.
Service Provider field	(Optional) The name of the service provider associated with this account, if any.

Step 7 Click Add.

Cisco UCS Director tests the connection to the NetApp storage system. If that test is successful, it adds the NetApp account and discovers all infrastructure elements in the storage system that are associated with that account, including the server's information, slots, processors, memory, and NICs. This discovery process and inventory collection cycle takes a few minutes to complete.

The polling interval configured in **System Tasks** on **Administration > System** specifies the frequency of inventory collection. For more information about configuring the polling interval, see the [Cisco UCS Director Network Devices Management Guide](#).

Testing the Connection to a NetApp Account

You can test the connection after you add an account to a pod.

Procedure

-
- Step 1** Choose **Administration > Physical Accounts**.
 - Step 2** On the **Physical Accounts** page, click **Physical Accounts**.
 - Step 3** Choose the account for which you want to test the connection.
 - Step 4** Click **Test Connection**.
 - Step 5** After the connection test is complete, click **Close**.
-

What to do next

If the connection fails, verify the configuration of the account, including the username and password. If those items are correct, determine whether there is a network connectivity problem.

Verifying the Discovery of a NetApp Account

After you add a NetApp account to Cisco UCS Director, you can verify that the account is properly added and its relevant data has been collected. It can take few minutes to complete auto-discovery and populate the data.

Procedure

-
- Step 1** Choose **Physical > Storage**.
 - Step 2** On the **Storage** page, choose the pod that includes the NetApp account that you want to verify.
 - Note** The left column tree structure lists nodes for **Sites**, **Unassigned Pods**, and **Multi-Domain Managers**. When you expand a Sites node, all the pods for that site node are displayed. When you expand an Unassigned Pods node, all the pods that are not assigned to any site are displayed. When you expand the Multi-Domain Managers node, all multi-domain manager account types that you added to Cisco UCS Director are displayed.
 - Step 3** Click **Storage Accounts**.
 - Step 4** Click the row with the account that you want to verify and click **View Details**.

Cisco UCS Director displays the components of the NetApp server at the filer level for both ONTAP and OnCommand account types. To view the components of the filer, choose the filer and click **View Details**.

Requirements for Adding SVMs to Cisco UCS Director

After provisioning a SVM, you can directly add the SVM to Cisco UCS Director. Before you add a SVM, consider the following requirements:

- **User Account:** Use the default vsadmin account or any other user account created on the SVM. To use the default vsadmin account, unlock the vsadmin account and provide a password.
- **Access:** Enable access to the ontapi application for the selected user account. Also provide vsadmin role to the user account so that Cisco UCS Director performs the necessary read and write actions on the SVM.

The following example shows the role and access levels necessary to add a SVM.

```
a05-cluster::> security login show -SVM Goldfinger -username vsuser
```

```
SVM: Goldfinger
```

UserName	Application	Authentication Method	Role Name	Acct Locked
mynewuser	ontapi	password	vsadmin	no

- **Management LIF:** Associate a management LIF with the SVM. Set the LIF type to data and the data protocol to none.

Adding SVMs Directly to Cisco UCS Director

Procedure

- 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:

Name	Description
Pod drop-down list	Choose Default Pod .
Category drop-down list	Choose Storage . This is the type of infrastructure for the account.
Account Type drop-down list	Choose the NetApp ONTAP account.

- Step 5** Click **Submit**.

Step 6 On the second **Add Account** screen, complete the following fields:

Name	Description
Account Name field	A unique name that you assign to this account.
Server Address field	The IP address of the SVM.
Use Credential Policy check box	Check this box if you want to use a credential policy for this account rather than enter the username and password information manually.
Credential Policy drop-down list	If you checked the Use Credential Policy check box, choose the credential policy that you want to use from this drop-down list. This field is displayed only if you choose to use a credential policy.
User ID field	The username that this account will use to access the NetApp server. This username must be a valid account in the NetApp server. This field is not displayed if you chose to use a credential policy.
Password field	The password associated with the username. This field is not displayed if you chose to use a credential policy.
Transport Type drop-down list	Choose one of the following transport types that you want to use for this account: • http • https
Port field	The port used to access the NetApp account.
Connection Time Out (Seconds) field	The length of time in seconds that Cisco UCS Director will wait to establish a connection to the NetApp device before timing out. The valid values are from 0 to 1800. An empty field or a value of 0 is interpreted as an infinite time out.
Description field	(Optional) A description of this account.
Contact Email field	(Optional) The email address that you can use to contact the administrator or other person responsible for this account.
Location field	(Optional) The location of this account, in any.
Service Provider field	(Optional) The name of the service provider associated with this account, if any.

Step 7 Click **Add**.



CHAPTER 4

Monitoring and Reporting for an OnCommand Account

This chapter contains the following sections:

- [About Monitoring and Reporting for an OnCommand Account, on page 13](#)
- [About Disks, on page 14](#)
- [Managing Filers, on page 14](#)
- [Managing Virtual Machines, on page 15](#)
- [Creating a VLAN, on page 17](#)
- [Managing IP Spaces, on page 18](#)
- [Managing vFilers, on page 20](#)
- [Managing Aggregates, on page 25](#)
- [Managing Initiator Groups, on page 26](#)
- [Managing Initiators, on page 28](#)
- [Managing LUNs, on page 29](#)
- [Managing Volumes, on page 31](#)
- [Managing SnapMirror Relationship, on page 34](#)
- [Managing QTrees and Creating a Quota, on page 37](#)

About Monitoring and Reporting for an OnCommand Account

Cisco UCS Director displays all managed and discovered components in a NetApp OnCommand account that manages the NetApp ONTAP accounts. These components can be hardware or software. You can also add a component and set up a component, and view reports for each of the discovered or added components.

Components You Can Monitor

The components in the NetApp OnCommand account are as follows:

- Filers
- VMs
- Aggregates
- Volumes

- Qtree
- Quotas
- LUNs
- Disks
- Initiator Groups
- Initiators
- License
- SnapMirrors
- vFilers
- IP Spaces
- Interfaces
- FC Adapters
- NFS Exports
- CIFS Shares

About Disks

Disks are grouped together in an aggregate. These aggregates provide storage to the volumes that are associated with the aggregate.

When you click **Disks**, all the disks that are available in that account are displayed. Click the row of the disk and then click **View Details** to view the summary details of the disk.

Managing Filers

The NetApp filer, known also as NetApp Fabric-Attached Storage (FAS), functions in an enterprise-class storage area network (SAN) as well as a networked storage appliance. It can use file-based protocols such as NFS, CIFS, FTP, TFTP, and HTTP. Filers can also serve data over block-based protocols such as Fibre Channel (FC), Fibre Channel over Ethernet (FCoE), and iSCSI. NetApp Filers implement their physical storage in large disk arrays.

Procedure

-
- 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 NetApp OnCommand account and then click **View Details**.

Step 5 Click **Filers**.

Step 6 Click the row of the filer you want to manage and then click **View Details**.

Managing Virtual Machines

Procedure

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 NetApp OnCommand account and then click **View Details**.

Step 5 Click **Filers**.

Step 6 Click the row of the filer you want to manage and then click **View Details**.

Step 7 Click **VMs**.

When you choose a VM, the following additional actions appear:

Action	Description
View Details	Displays summary and service request details of the VM.
Stack View	Displays the stack view of the VM.
Access VM Credentials	Displays the credentials of the VM. Note If permissions are given during VM creation, the details for the particular group/admin users will be displayed. An "Access denied" message is shown if access is not provided.
Launch VM Client	Launch the VM client through one of the following access scheme: • Web Access • Remote Desktop • VMRC Console Note Launch access can also be defined during VM creation. If permission is granted, you can launch the VM using any of the above options.

Action	Description
Assign VM	Assigns the VM to a user group and a user. To assign the VM to a user group and a user, complete the following fields: • VM Name field—<i>Display Only</i>. The name of the VM. • User Group drop-down list—Choose a user group to which you want to assign the VM. Note You can choose only groups with valid virtual data center (VDC). • Assign to Users check box—Check this check box to assign the VM to a user. Choose a user from the User drop-down list that appears when you choose the Assign to Users check box. • vDC drop-down list—Choose a vDC from the list. • Category drop-down list—Choose a category under which the VM needs to be categorized. • VM User Label field—The label for the VM user. • Set Provision Time check box—Check this check box to set the time at which the VM needs to be provisioned. Set the date and time in the Provision Date/Time field that appears when you choose the Set Provision Time check box. • Comments field—Comments, if any.
Configure Lease Time	Sets the lease time for configuring the VM.
Resize VM	Resizes the VM. To resize the VM, complete the following fields: VM Name field—<i>Display Only</i>. The name of the VM. Current Allocated CPU field—<i>Display Only</i>. The current size of CPU allocated to the VM. Current Allocated Memory (GB) field—<i>Display Only</i>. The current allocated memory of the VM. New CPU Count drop-down list—Choose the new CPU size of the VM. New Memory drop-down list—Choose the new memory size of the VM.

Action	Description
Power ON	Turns on the VM. To turn on the VM, complete the following fields: a. VM Name field—<i>Display Only</i>. The name of the VM. b. Task field—<i>Display Only</i>. The task to be applied for the VM. c. Comments field—Comments, if any. d. Schedule Action Pane—Choose Execute Now or Execute Later to turn on the VM immediately or later. Note Once the VM is turned on, execute the VM level inventory collection to get the updated IP address.
Power OFF	Turns off the VM. To turn off the VM, complete the following fields: a. VM Name field—<i>Display Only</i>. The name of the VM. b. Task field—<i>Display Only</i>. The task to be applied for the VM. c. Comments field—Comments, if any. d. Schedule Action Pane—Choose Execute Now or Execute Later to turn off the VM immediately or later.

Creating a VLAN

You can partition a single layer-2 network to create multiple distinct broadcast domains, which are mutually isolated so that packets can only pass between them through one or more routers. This domain is referred to as a VLAN.

Procedure

- 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 NetApp OnCommand account and then click **View Details**.
- Step 5** Click **Filers**.
- Step 6** Click the row of the filer you want to manage and then click **View Details**.

Step 7 Click **Interfaces**.

Step 8 Click **Create VLAN**.

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

Name	Description
Select Interface drop-down list	Choose a network interface from the list of interfaces that shows both the physical interface and interface groups.
vLAN ID field	ID of the VLAN. Note The VLAN ID must be in the range from 0 to 4094.

Step 10 Click **Create**.

Step 11 Click the VLAN to perform the following actions:

Name	Description
View Details drop-down list	Displays the service request details of the VLAN.
Delete field	Deletes the selected VLAN after confirmation.

What to do next

Assign an IP space to a VLAN where an IP space defines a distinct IP address space in which Filer units can participate.

Managing IP Spaces

An IP space defines a distinct IP address space in which vFiler units can participate. IP addresses defined for an IP space are applicable only within that IP space. A distinct routing table is maintained for each IP space. No cross-IP space traffic is routed.

Procedure

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 NetApp OnCommand account and then click **View Details**.

Step 5 Click **Filers**.

Step 6 Click the row of the filer you want to manage and then click **View Details**.

Step 7 Click the **IP Spaces** tab.

When you choose an IP Space, the following additional actions appear:

Action	Description
Create	Creates an IP space in the filer.
View Details	Displays the service request details of the IP space.
Delete	Deletes the selected IP space after confirmation.
Assign	Assigns the IP space to a VLAN.

Creating an IP Space

Ensure that the VLAN interface is added to the filer.

Procedure

- 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 NetApp OnCommand account and then click **View Details**.
- Step 5** Click **Filers**.
- Step 6** Click the row of the filer you want to manage and then click **View Details**.
- Step 7** Click **IP Spaces**.
- Step 8** Click **Create**.
- Step 9** In the **IP Space Name** field, enter the IP space name.
- Step 10** Click **Create**.

What to do next

Assign an IP space to a VLAN.

Assigning an IP Space to a VLAN Interface

Before you begin

Ensure that the VLAN interface is added to the filer.

Procedure

- 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 NetApp OnCommand account and then click **View Details**.
- Step 5** Click **Filers**.
- Step 6** Click the row of the filer you want to manage and then click **View Details**.
- Step 7** Click **IP Spaces**.
- Step 8** Click the row of an IP Space to which you want to assign a VLAN interface.
- Step 9** Click **Assign**.
The **Assign IP Space to a vLAN** screen appears.
- Step 10** From the **Select VLAN Interface** drop-down list, choose the VLAN interface.
- Step 11** Click **Assign**.

Managing vFilers

vFilers are ONTAP 7-mode virtual containers that create separate virtual filer instances within a physical controller. Using vFiler, you can partition the storage and network resources of a single storage system so that it appears as multiple storage systems on the network.

Procedure

- 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 NetApp OnCommand account and then click **View Details**.
- Step 5** Click **Filers**.
- Step 6** Click the row of the filer you want to manage and then click **View Details**.
- Step 7** Click **vFilers**.

When you choose a vFiler, the following additional actions appear:

Action	Description
Create	Creates a vFiler in the NetApp OnCommand account.
Setup	Sets up a vFiler.
Setup CIFS	Sets up a CIFS server for the vFiler.
Stop CIFS	Stops the CIFS service configured for the vFiler.
Delete	Deletes the vFiler.

Action	Description
View Details	Displays a storage summary of the vFiler. Click the tabs in the window for more details about the following vfiler components: • VMs • Volumes • LUNs • Qtrees • Quotas • Initiator groups • Initiators • SnapMirrors • NFS exports • CIFS shares • Service request details Note The Service Request Details tab is available for all components of the filer, which have been part of a service request. The components that are displayed in this tab are: aggregates, volumes, LUNs, IP spaces, initiator groups, vFilers, OnCommand datasets, and OnCommand groups. The Service Request Details tab displays the ID and change description of the service requests that have changed the state of the storage device or component selected. Any storage device or component that has been part of a task in an executed workflow is tracked based on the ID of the service request.
Assign Group	Assigns a vFiler to a group.
Add Hosts	Adds host to the vFiler.
Manage Tag	Adds a tag to the vFiler, edit the assigned tag, and delete the tag from the vFiler group. Note The tags that are assigned with the Taggable Entities as physical storage and network device when you create a tag are displayed. For more information on the tab library, see Cisco UCS Director Administration Guide.

Action	Description
Add Tags	Adds a tag to the vFiler. Note The tags that are assigned with the Taggable Entities as physical storage and network device when you create a tag are displayed. For more information on the tab library, see Cisco UCS Director Administration Guide.
Delete Tags	Deletes the tag(s) from the vFiler. Note The tags that are assigned with the Taggable Entities as physical storage and network device when you create a tag are displayed. For more information on the tab library, see Cisco UCS Director Administration Guide.

Creating a vFiler

Before you begin

Create an IP Space and assign it to a VLAN.

Procedure

- 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 NetApp OnCommand account and then click **View Details**.
- Step 5** Click **Filers**.
- Step 6** Click the row of the filer you want to manage and then click **View Details**.
- Step 7** Click **vFilers**.
- Step 8** Click **Create**.
- Step 9** On the **Create vFiler** screen, complete the following fields:

Name	Description
Select IP Space Name drop-down list	Choose the IP space to control the configuration of multiple IP address spaces (ipspace) on a vfiler.
vFiler Name field	A unique name that you assign to this vFiler.
IP Address field	The IP address of the vFiler.
Select Storage Unit field	Choose a storage unit.

Step 10 Click **Create**.

Setting up a vFiler

Procedure

- 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 NetApp OnCommand account and then click **View Details**.
- Step 5** Click **Filers**.
- Step 6** Click the row of the filer you want to manage and then click **View Details**.
- Step 7** Click **vFilers**.
- Step 8** Click the vfiler and click **Setup**.
- Step 9** On the **Setup vFiler** screen, complete the following fields:

Name	Description
Root Password field	The root password of the vFiler.
Subnet Mask field	The subnet mask of the vFiler.
Interface Name drop-down list	Choose a VLAN interface.
VLAN ID field	The VLAN ID.
Protocols field	Click Select and choose one or all of the protocols that the vFiler supports: • NFS • CIFS • iSCSI

Step 10 Click **Submit**.

Setting up a CIFS Server for a vFiler

Procedure

- 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 NetApp OnCommand account and then click **View Details**.
- Step 5** Click **Filers**.
- Step 6** Click the row of the filer you want to manage and then click **View Details**.
- Step 7** Click **vFilers**.
- Step 8** Click the vfiler and click **Setup CIFS**.
- Step 9** On the **Setup CIFS** screen, complete the following fields:

Name	Description
Authentication drop-down list	Choose the authentication style as Active Directory. The authentication style determines the method by which clients are authenticated when connecting to the CIFS server.
Security Style drop-down list	Choose the security style as NTFS or Multiprotocol . The security style determines whether the CIFS service will support multiprotocol access.
DNS Domain Name field	The name of the domain that the CIFS server will join. It can be NetBIOS or any fully qualified domain name, such as cifsdomain or cifs.domain.com.
Login User field	The name of the domain user who has the ability to add the CIFS server to the domain given in the DNS Domain Name field.
Login Password field	The password of the login user.
Organization Unit field	The distinguished name of the organizational unit that the CIFS service will become a member of. By default, the filer will join the 'CN=Computers' organizational unit.
Site Name field	The name of the site that the CIFS service will become a member of.
vFiler Root Password field	The root password of the vFiler.

- Step 10** Click **Submit**.
The CIFS service starts automatically when this configuration is completed. You can stop the CIFS service by clicking **Stop CIFS**.

Assigning a vFiler to a Group

Procedure

- 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 NetApp OnCommand account and then click **View Details**.
- Step 5** Click **Filers**.

Step 6 Click the row of the filer you want to manage and then click **View Details**.

Step 7 Click **vFilers**.

Step 8 Click the vFiler to which you want to assign a group and click **Assign Group**.

Step 9 On the **Select Group** screen, complete the following fields:

Name	Description
Assign to Users check box	Check this box to assign the vFiler to a user. Choose a user to which vFiler has to be assigned from the User drop-down list that appears when you check the Assign to Users check box.
Name drop-down list	Choose a group to which vFiler has to be assigned.
Label field	The label for the assigned group.

Step 10 Click **Submit**.

Managing Aggregates

An aggregate is a collection of one or two plexes, depending on whether you take advantage of RAID-level mirroring. A plex is a collection of one or more RAID groups that provide the storage for one or more file system volumes. If the aggregate is unmirrored, it contains a single plex.

Aggregates are used to manage plexes and RAID groups because these entities only exist as part of an aggregate. You can increase the usable space in an aggregate by adding disks to existing RAID groups or by adding new RAID groups. After disks are added to an aggregate, you cannot remove them to reduce storage space without deleting the aggregate.

Procedure

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 NetApp OnCommand account and then click **View Details**.

Step 5 Click **Filers**.

Step 6 Click the row of the filer you want to manage and then click **View Details**.

Step 7 Click **Aggregates**.

When you choose an aggregate, the following additional actions appear:

Action	Description
Create	Creates an aggregate in the NetApp OnCommand account.
Delete	Deletes an existing aggregate.
Online	Moves the aggregate to an online state.

Action	Description
Offline	Moves the aggregate to an offline state.
Add Disk	Adds a disk to the aggregate.
Manage Tag	Adds a tag to the aggregate, edits the assigned tag, and deletes the tag from the aggregate group. Note The tags for which the Taggable Entities are assigned as physical storage and NetApp aggregate are displayed. For more information on the tab library, see Cisco UCS Director Administration Guide.
Add Tags	Adds a tag to the aggregate. Note The tags for which the Taggable Entities are assigned as physical storage and NetApp aggregate are displayed. For more information on the tab library, see Cisco UCS Director Administration Guide.
Delete Tags	Deletes the tag(s) from the aggregate. Note The tags for which the Taggable Entities are assigned as physical storage and NetApp aggregate are displayed. For more information on the tab library, see Cisco UCS Director Administration Guide.

Managing Initiator Groups

An initiator group (igroup) specifies which initiators can have access to a LUN. When you map a LUN on a storage system to an initiator group, you grant all the initiators in that group access to that LUN.

Procedure

- 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 NetApp OnCommand account and then click **View Details**.
- Step 5** Click **Filers**.
- Step 6** Click the row of the filer you want to manage and then click **View Details**.
- Step 7** Click **Initiator Groups**.

When you choose an initiator group, the following additional actions appear:

Action	Description
Create	Creates an initiator group to the NetApp OnCommand account.
View Details	Displays the service request details of the selected initiator group.
Delete	Deletes the initiator group.
ALUA	Enables the Asymmetric Logical Unit Access (ALUA) protocol to identify optimized paths between a storage system and a host.

Creating an Initiator Group

Procedure

- 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 NetApp OnCommand account and then click **View Details**.
- Step 5** Click **Filers**.
- Step 6** Click the row of the filer you want to manage and then click **View Details**.
- Step 7** Click **Initiator Groups**.
- Step 8** Click **Create**.
- Step 9** On the **Create Initiator Group** screen, complete the following fields:

Name	Description
Initiator Group Name	A unique name that you assign to this initiator group.
Group Type drop-down list	Choose the type of the initiator group as one of the following: • iSCSI • FCP
OS Type drop-down list	Choose the OS type of the initiators within the group.
Portset field	Name of a current port set to bind to the newly created igroup.

- Step 10** Click **Create**.

Managing Initiators

In a NetApp SAN environment, hosts are initiators and storage appliances are targets which have storage target devices that are referred to as LUNs.

Procedure

- 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 NetApp OnCommand account and then click **View Details**.
- Step 5** Click **Filers**.
- Step 6** Click the row of the filer you want to manage and then click **View Details**.
- Step 7** Click **Initiators**.

The following action appears:

Action	Description
Create	Adds an initiator to the NetApp OnCommand account.

When you choose an initiator, the **Delete** option appears. The **Delete** option is used to delete the initiator.

Creating an Initiator

An initiator is a part of an initiator group. You can add an initiator to an initiator group.

Procedure

- 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 NetApp OnCommand account and then click **View Details**.
- Step 5** Click **Filers**.
- Step 6** Click the row of the filer you want to manage and then click **View Details**.
- Step 7** Click **Initiators**.
- Step 8** Click **Create**.
- Step 9** On the **Create Initiator** screen, complete the following fields:

Name	Description
Initiator Group Name drop-down list	Choose the initiator group under which the initiator is to be added.

Name	Description
Initiator Name field	A unique name that you assign to this initiator.
Force check box	Check this box to forcibly add the initiator.

Step 10 Click **Create**.

Managing LUNs

A logical unit number (LUN) is used to identify a logical unit, which is a device that is addressed by the SCSI protocol or similar protocols such as Fibre Channel or iSCSI. LUNs are central to the management of block storage arrays shared over a storage area network (SAN).

Procedure

- 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 NetApp OnCommand account and then click **View Details**.
- Step 5** Click **Filers**.
- Step 6** Click the row of the filer you want to manage and then click **View Details**.
- Step 7** Click **LUNs**.

When you choose a LUN, the following additional actions appear:

Action	Description
Create	Creates an LUN in the NetApp OnCommand account.
View Details	Displays summary and service request details of the LUN.
View Connectivity	Displays connectivity of the LUNs to Datastores. Cisco UCS Director provides the four types of view mode: Hierarchical, Concentric, Circular, and Force Directed. Depending on the view mode that you choose, you can adjust item spacing, distance, radius, rigidity, and force distance.
On/Off	Moves the LUN to the online or offline state.
Map iGroup	Maps the LUN to one of the existing initiator groups. Choose the iGroup from the Initiator Group drop-down list. Check the Specify LUN ID check box to specify the LUN ID. If not specified, the system generates a LUN ID automatically.

Action	Description
Unmap iGroup	Unmaps the iGroup from the selected LUN after confirmation.
Resize	Resizes the LUN. To resize the LUN, complete the following fields: a. LUN Name field—<i>Display Only</i>. The name of the LUN. b. Current LUN Size field—<i>Display Only</i>. The current size of the LUN. c. New Size field—The required size of the LUN. d. Size Units drop-down list—Choose the size of the LUN as MB, GB, or TB.
Move	Renames the LUN.
Clone	Clones the LUN in another destination.
Modify ID	Changes the LUN ID.
Delete	Deletes the LUN.

Creating a LUN

Procedure

- 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 NetApp OnCommand account and then click **View Details**.
- Step 5** Click **Filers**.
- Step 6** Click the row of the filer you want to manage and then click **View Details**.
- Step 7** Click **LUNs**.
- Step 8** Click **Create**.
- Step 9** On the **Create LUN** screen, complete the following fields:

Name	Description
Select Volume drop-down list	Choose the volume in which you want to add the LUN.
LUN Name field	The name of the LUN.

Name	Description
LUN Size field	The size of the LUN to be created.
Size Unit drop-down list	Choose the size of the volume as MB , GB , or TB .
OS Type drop-down list	Choose the OS type from the list.
Space Reserve check box	By default, the LUN has a reserved space. Check this box to manage the space usage manually and to create a LUN without any space being reserved.

Step 10 Click **Create**.

Managing Volumes

A volume is a logical file system whose structure is made visible to users when you export the volume to a UNIX host through an NFS mount or to a Windows host through a CIFS share. A volume is the most inclusive of the logical containers. It can store files and directories, qtrees, and LUNs.

Procedure

- 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 NetApp OnCommand account and then click **View Details**.
- Step 5** Click **Filers**.
- Step 6** Click the row of the filer you want to manage and then click **View Details**.
- Step 7** Click **Volumes**.

When you choose a volume, the following additional actions appear:

Action	Description
Create	Creates a volume in the NetApp OnCommand account.
View Details	Displays a summary of the volume. Click the tabs in the window for more details about the following volume components: • Qtrees • LUNs • Snapshot • Service request details

Action	Description
Delete	Deletes the volume.
Resize	Resizes an existing volume. To resize the volume, complete the following fields: a. New Size field—The required size of the volume. b. Size Units drop-down list—Choose the size of the volume as MB, GB, or TB. c. File System Size Fixed check box—Check this box to fix the file system size.
Offline	Moves the volume to the offline state.
Online	Moves the volume to the online state.
Dedup On	Enables data deduplication on the volume.
Dedup Off	Disables data deduplication on the volume.
NFS Export	Exports the volume as a file through NFS. To export the volume, complete the following fields: a. Export Path field—The path where the volume should be mounted in the UNIX environment. b. Read-Write Hosts field—The comma-separated list of hosts that have read-write access to the volume. c. Root Hosts field—The comma-separated list of hosts that have root access to the volume. d. Security drop-down list—Choose the security applicable for this export. e. Persists NFS Export Rule check box—Check this box to persist the NFS export rule.
Snapshot	Creates a snapshot of the volume. To create a snapshot of the volume, complete the following fields: a. Snapshot Name field—The name of the snapshot. b. Is Valid LUN Clone Snapshot check box—Check this check box when the snapshot create has been requested by snapvault so that all backup snapshots for the LUN clones are locked. c. Async check box—Check this check box to create the snapshot asynchronously.

Action	Description
Resize Snapshot	Resizes the snapshot space allocated on a volume. The space within a volume can be defined for the snapshots taken on a volume in terms of percentage. a. New Percentage (%) —The percentage of volume space to be reserved for snapshots.

Creating a Volume

Procedure

- 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 NetApp OnCommand account and then click **View Details**.
- Step 5** Click **Filers**.
- Step 6** Click the row of the filer you want to manage and then click **View Details**.
- Step 7** Click **Volumes**.
- Step 8** Click **Create**.
- Step 9** On the **Create Flexible Volume** screen, complete the following fields:

Name	Description
Aggregate pane	Check the check boxes to choose an aggregate under which you want to create the volume.
Space Guarantee drop-down list	Choose one of the following as the type of volume guarantee the volume will use: • Volume • File • None
Volume Name field	Name of the volume.
Volume Size field	Size of the volume to be created.
Size Unit drop-down list	Choose the size of the volume as MB, GB, or TB.
Snapshot Size field	The snapshot size in percentage to be used by the volume.
Security Style NTFS check box	Check this box to set security style as NTFS.

Name	Description
NFS Export check box	Check this box to create NFS export path automatically.

Step 10 Click **Create**.

Managing SnapMirror Relationship

NetApp SnapMirror software is an enterprise-level disaster recovery and data distribution solution. SnapMirror mirrors data to one or more network filers at high speed over LAN or WAN connections.

Procedure

- 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 NetApp OnCommand account and then click **View Details**.
- Step 5** Click **Filers**.
- Step 6** Click the row of the filer you want to manage and then click **View Details**.
- Step 7** Click **SnapMirrors**.

The following actions appear:

Name	Description
Create Connection	Set up a new connection or modify existing connection.
Delete Connection	Delete a SnapMirror Connection.
Remote Access	Provide access to remote filer (source filer) to the destination volume.
Schedules	Create SnapMirror schedule
Enable	Turn on SnapMirror.
Disable	Turn off SnapMirror.

On selecting a SnapMirror, the following additional actions appear:

Action	Description
Inventory	Runs a SnapMirror inventory.
View Details	Displays the Status History and allows you to edit, delete and run inventory on a schedule.

Action	Description
Initialize	Initializes a SnapMirror. After initializing a SnapMirror Relationship, you will get the following actions: • Quiesce—Pauses transfer to the destination. • Break—Breaks the SnapMirrored relationship. You cannot check whether the operation is legal, or whether it is successful. Result will be updated after the inventory collected in this task. • Update—Update the SnapMirror relationship.
Delete	Deletes the SnapMirror.

Configuring a SnapMirror Relationship

Procedure

- 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 NetApp OnCommand account and then click **View Details**.
- Step 5** Click **Filers**.
- Step 6** Click the row of the filer you want to manage and then click **View Details**.
- Step 7** Click **SnapMirrors**.
- Step 8** Click **Create Connection**.
- Step 9** On the **Configure** screen, complete the following fields:

Name	Description
Connection Name drop-down list	Choose the connection name to modify the connection. Choose New Connection to create a new connection.
New Connection Name field	If you have chosen to configure a new connection, enter the name of the connection in the field.

Name	Description
Mode drop-down list	Choose one of the following as the type of mode: • Multi • Failover Note In multi-mode, the first address pair provides a connection path. In failover mode, the first address pair provides the preferred connection path.
Source Address field	The source address in the form of the filer name or IP address in the Address Pair 1 and Address Pair 2 area.
Destination Address field	The source address in the form of the filer name or IP address in the Address Pair 1 and Address Pair 2 area.

Step 10 Click **Submit**.

Scheduling a SnapMirror

Procedure

- 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 NetApp OnCommand account and then click **View Details**.
- Step 5** Click **Filers**.
- Step 6** Click the row of the filer you want to manage and then click **View Details**.
- Step 7** Click **SnapMirrors**.
- Step 8** Click **Schedules**.
- Step 9** On the **Schedules** screen, do the following:
- Click the **Add** icon in the **Schedules** pane.
 - On the **Add Entry to Schedule** screen, complete the following fields:

Name	Description
Source Location field	Click Select and choose the source locations of a schedule to set.

Name	Description
Select Option drop-down box	Choose one of the following options to choose either an existing volume or a new volume in the current filer or vfiler: • Existing Destination • New Destination
Destination Location drop-down box	Choose the destination location.
Minutes field	Minutes in the hour for which the schedule is set. Possible values are (-) = match nothing, (1) = match minute 1, (1,3) = match minute 1 and 3, and (*) = match all possible legal values.
Hours field	Hours in the day for which the schedule is set. Possible values are (-) = match nothing, (1) = match hour 1, (1,3) = match hour 1 and 3, and (*) = match all possible legal values.
Days of Month field	Days in the month for which the schedule is set. Possible values are (-) = match nothing, (1) = match day 1, (1,3) = match day 1 and 3, (2-5) = match day 2,3,4,5, and (*) = match all possible legal values.
Days of Week field	Days in the week for which the schedule is set. 0 represents Sunday, and 6 represents Saturday. Possible values are (-) = match nothing, (1) = match day 1 (Monday), (1,3) = match day 1 (Monday) and 3 (Wednesday), (2-5) = match day 2,3,4,5 (Tuesday to Friday), and (*) = match all possible legal values.
Max Transfer Rate (KB) field	Maximum transfer rate kilobytes per second.

c) Click **Submit**.

Step 10

Click **Submit**.

Managing QTrees and Creating a Quota

A QTree is similar in concept to a partition. It creates a subset of a volume to which a quota can be applied to limit its size. As a special case, a QTree can be the entire volume. A QTree is more flexible than a partition because you can change the size of a QTree at any time.

Procedure

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 NetApp OnCommand account and then click **View Details**.
- Step 5** Click **Filers**.
- Step 6** Click the row of the filer you want to manage and then click **View Details**.
- Step 7** Click **Qtrees**.

When you choose a QTree, the following additional actions appear:

Action	Description
Delete	Deletes a QTree.
Create Quota	Creates a quota in the QTree. a. In the Create Quota window, complete the following fields: • Disk Space Hard Limit (GB) field—The maximum disk space value in GB. • Disk Space Soft Limit (GB) field—The soft limit disk space value in GB. • Files Hard Limit field—The maximum number of files in the quota. • Files Soft Limit field—The soft limit for the number of files in the quota. • Threshold (GB) field—The threshold limit disk space value in GB. • Quota Type drop-down list—Choose Tree from the drop-down list. b. Click Create.

Creating a QTree

Procedure

- 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 NetApp OnCommand account and then click **View Details**.
- Step 5** Click **Filers**.

Step 6 Click the row of the filer you want to manage and then click **View Details**.

Step 7 Click **Volumes**.

Step 8 Choose the volume in which you want to create the QTree.

Step 9 From the **More Actions** drop-down-list, choose **Create QTree**.

Step 10 On the **Create QTree** screen, do the following:

- a) The selected volume name is displayed in the **Volume Name** field.
- b) In the **QTree Name** field, enter the name of the QTree.

Step 11 Click **Create**.



CHAPTER 5

Monitoring and Reporting for an ONTAP Account

This chapter contains the following sections:

- [About Monitoring and Reporting for an ONTAP Account, on page 41](#)
- [About Disks, on page 42](#)
- [Managing Filers, on page 42](#)
- [Managing Virtual Machines, on page 43](#)
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About Monitoring and Reporting for an ONTAP Account

Cisco UCS Director displays all managed components in each of the ONTAP accounts. These components can be hardware or software. You can also add a component and set up a component, and view reports for each of the discovered or added components.

Components You Can Monitor

You can monitor each component and perform tasks such as creating, deleting, and modifying these components. The following components are monitored in an ONTAP account:

- Aggregates
- Volumes
- QTrees
- Quotas

- VMs
- LUNs
- Disks
- Initiator Groups
- Initiators
- License
- SnapMirrors
- SnapVault
- vFilers
- IP Spaces
- Interfaces
- FC Adapters
- NFS Exports
- CIFS Shares

About Disks

Disks are grouped together in an aggregate. These aggregates provide storage to the volumes that are associated with the aggregate.

When you click **Disks**, all the disks that are available in that account are displayed. Click the row of the disk and then click **View Details** to view the summary details of the disk.

Managing Filers

The NetApp filer is a type of disk storage device that owns and controls a file system and presents files and directories over the network. It uses an operating system called Data ONTAP.

Procedure

-
- 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 NetApp ONTAP account and then click **View Details**.
 - Step 5** Click **Filers**.
 - Step 6** Click the row of a filer and the following actions become available:

Action	Description
View Details	Displays information about the current status of the selected component.
Persist Network Configuration	Displays the number of changes detected between the previously saved persistent configuration and the newly generated persistent configuration.
Add Hosts	Allows you to update the IP address and name of remote system for host address resolution.

Managing Virtual Machines

Procedure

- 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 NetApp ONTAP account and then click **View Details**.
- Step 5** Click **Filers**.
- Step 6** Click the row of a filer and then click **View Details**.
- Step 7** On the **Storage Filer** page, click **VMs**.

When you choose a VM, the following additional actions appear:

Action	Description
View Details	Displays summary and service request details of the VM.
Stack View	Displays the stack view of the VM.
Access VM Credentials	Displays the credentials of the VM.
Launch VM Client	Launches the VM client through one of the following access scheme: • Web Access • Remote Desktop • VMRC Console

Action	Description
Assign VM	Assigns the VM to a user group and a user. To assign the VM to a user group and a user, complete the following fields: • VM Name field—<i>Display Only</i>. The name of the VM. • User Group drop-down list—Choose a user group to which you want to assign the VM. Note You can choose only groups with valid virtual data center (VDC). • Assign to Users check box—Check this check box to assign the VM to a user. Choose a user from the User drop-down list that appears when you choose the Assign to Users check box. • vDC drop-down list—Choose a vDC from the list. • Category drop-down list—Choose a category under which the VM needs to be categorized. • VM User Label field—The label for the VM user. • Set Provision Time check box—Check this check box to set the time at which the VM needs to be provisioned. Set the date and time in the Provision Date/Time field that appears when you choose the Set Provision Time check box. • Comments field—Comments, if any.
Configure Lease Time	Sets the lease time for configuring the VM.
Resize VM	Resizes the VM. To resize the VM, complete the following fields: VM Name field—<i>Display Only</i>. The name of the VM. Current Allocated CPU field—<i>Display Only</i>. The current size of CPU allocated to the VM. Current Allocated Memory (GB) field—<i>Display Only</i>. The current allocated memory of the VM. New CPU Count drop-down list—Choose the new CPU size of the VM. New Memory drop-down list—Choose the new memory size of the VM.

Action	Description
Power ON	Turns on the VM. To turn on the VM, complete the following fields: a. VM Name field—<i>Display Only</i>. The name of the VM. b. Task field—<i>Display Only</i>. The task to be applied for the VM. c. Comments field—Comments, if any. d. Schedule Action Pane—Choose Execute Now or Execute Later to turn on the VM immediately or later. Note Once the VM is turned on, execute the VM level inventory collection to get the updated IP address.
Power OFF	Turns off the VM. To turn off the VM, complete the following fields: a. VM Name field—<i>Display Only</i>. The name of the VM. b. Task field—<i>Display Only</i>. The task to be applied for the VM. c. Comments field—Comments, if any. d. Schedule Action Pane—Choose Execute Now or Execute Later to turn off the VM immediately or later.

Managing Interfaces

Procedure

-
- 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 NetApp ONTAP account and then click **View Details**.
 - Step 5** Click **Filers**.
 - Step 6** Click the row of a filer and then click **View Details**.
 - Step 7** On the **Storage Filer** page, click **Interfaces**.
-

Creating a VLAN

Procedure

-
- 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 NetApp ONTAP account and then click **View Details**.
- Step 5** Click **Filers**.
- Step 6** Click the row of a filer and then click **View Details**.
- Step 7** On the **Storage Filer** page, click **Interfaces**.
- Step 8** Click **Create VLAN** and complete the required fields:
- From the **Select Interface** drop-down list, choose a network interface from the list of physical interfaces and interface groups.
 - In the **VLAN ID** field, enter a range of 0 to 4094.
- Step 9** Click **Create**.
-

Managing IP Spaces

An IP space defines a distinct IP address space in which vFiler units can participate. IP addresses defined for an IP space are applicable only within that IP space. A distinct routing table is maintained for each IP space. No cross-IP space traffic is routed.

Procedure

-
- 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 NetApp ONTAP account and then click **View Details**.
- Step 5** Click **Filers**.
- Step 6** Click the row of a filer and then click **View Details**.
- Step 7** On the **Storage Filer** page, click **IP Spaces**.

When you choose an IP Space, the following additional actions appear:

Action	Description
Create	Creates an IP space in the filer.
View Details	Displays the service request details of the IP space.
Delete	Deletes the selected IP space after confirmation.

Action	Description
Assign	Assigns the IP space to a VLAN.

Creating an IP Space

Procedure

- 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 NetApp ONTAP account and then click **View Details**.
- Step 5** Click **Filers**.
- Step 6** Click the row of a filer and then click **View Details**.
- Step 7** On the **Storage Filer** page, click **IP Spaces**.
- Step 8** Click **Create**, and in the **IP Space Name** field, enter the IP space name.
- Step 9** Click **Create**.

Managing vFilers

vFilers are ONTAP 7-mode virtual containers that create separate virtual filer instances within a physical controller. When you use a vFiler, you can partition the storage and network resources of a single storage system so that it appears as multiple storage systems on the network.

Procedure

- 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 NetApp ONTAP account and then click **View Details**.
- Step 5** Click **Filers**.
- Step 6** Click the row of a filer and then click **View Details**.
- Step 7** On the **Storage Filer** page, click **vFilers**.

When you choose a vFiler, the following additional actions appear:

Action	Description
Create	Creates a vFiler in the NetApp ONTAP account.

Action	Description
Setup	Sets up a vFiler.
Setup CIFS	Sets up a CIFS server for the vFiler.
Stop CIFS	Stops the CIFS service configured for the vFiler.
Delete	Deletes the vFiler.
View Details	Displays a storage summary of the vFiler. Click the tabs in the window for more details about the following vFiler component: • Volumes • LUNs • Qtrees • Quotas • Initiator groups • Initiators • SnapMirrors • NFS exports • CIFS shares • Service request details
Assign Group	Assigns a vFiler to a group. Provide inputs for the following fields and click Submit: Assign To Users check box—Check this box to allow resource assignment to users. Group drop-down list—Choose a group to which the vFiler has to be assigned. Label field—Enter the label for the assigned group.
Add Hosts	Adds a host to the vFiler. Provide inputs for the following fields and click Submit: Host IP field—Enter the Host IP address. Host Name field—Enter the name of the host.

Creating a vFiler

Before you begin

Ensure that IP Space is created and assigned to a VLAN.

Procedure

- 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 NetApp ONTAP account and then click **View Details**.
- Step 5** Click **Filers**.
- Step 6** Click the row of a filer and then click **View Details**.
- Step 7** On the **Storage Filer** page, click **vFilers**.
- Step 8** Click **Create**.
- Step 9** On the **Create vFiler** screen, complete the following fields:

Name	Description
Select IP Space Name drop-down list	Choose the IP Space to control the configuration of multiple IP address spaces (ipspace) on a vFiler.
vFiler Name field	Enter a unique name that you assign to this vFiler.
IP Address field	Enter the IP address of the vFiler.
Select Storage Unit drop-down list	Choose the storage unit from the list.

- Step 10** Click **Create**.

Setting up a vFiler

Procedure

- 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 NetApp ONTAP account and then click **View Details**.
- Step 5** Click **Filers**.
- Step 6** Click the row of a filer and then click **View Details**.
- Step 7** On the **Storage Filer** page, click **vFilers**.

Step 8 Click the row of the vFiler and then click **Setup**.

Step 9 On the **Setup vFiler** screen, complete the following fields:

Name	Description
Subnet Mask field	Enter the subnet mask of the vFiler.
DNS Domain field	Enter the DNS domain.
DNS Server Addresses field	Enter a comma-separated list of DNS server IP addresses.
Default Gateway field	Enter the default gateway IP address.
Interface Name drop-down list	Choose a VLAN interface.
Protocols check boxes	Check the box for each protocol that the vFiler supports: • IP • TCP • UDP • ICMP

Step 10 Click **Submit**.

Setting up a CIFS Server for a vFiler

Procedure

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 NetApp ONTAP account and then click **View Details**.

Step 5 Click **Filers**.

Step 6 Click the row of a filer and then click **View Details**.

Step 7 On the **Storage Filer** page, click **vFilers**.

Step 8 Click the row of the vFiler and then click **Setup CIFS**.

Step 9 On the **Setup CIFS** screen, complete the following fields:

Name	Description
Authentication drop-down list	Choose Active Directory . The authentication style determines the method by which clients are authenticated when connecting to the CIFS Server.

Name	Description
Security Style drop-down list	Choose NTFS or Multi-Pprotocol . The security style determines whether the CIFS service will support multi-protocol access.
DNS Domain Name field	Enter the name of the domain that the CIFS server will join. It can be NetBIOS or any fully-qualified domain name; for example, cifsdomain, cifs.domain.com.
Login User field	Enter the name of the domain user who has the ability to add the CIFS server to the domain given in the DNS Domain Name field.
Login Password field	Enter the password of the login user.
Organizational Unit field	Enter the name of the organizational unit.
Site Name field	Enter the name of the site to which the CIFS service will become a member.
vFiler Root Password field	Enter the password of the vFiler root user.

Step 10

Click **Submit**.

The CIFS service starts automatically when this configuration is completed. You can stop the CIFS service by clicking **Stop CIFS**.

Managing Aggregates

An aggregate is a collection of one or two plexes, depending on whether you take advantage of RAID-level mirroring. A plex is a collection of one or more RAID groups that provide the storage for file system volumes. If the aggregate is unmirrored, it contains a single plex. If the SyncMirror feature is licensed and enabled, Data ONTAP adds a second plex to the aggregate, which serves as a RAID-level mirror for the first plex in the aggregate.

Procedure

- 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 NetApp ONTAP account and then click **View Details**.
- Step 5** Click **Filers**.
- Step 6** Click the row of a filer and then click **View Details**.
- Step 7** On the **Storage Filer** page, click **Aggregates**.
When you choose an aggregate, the following additional actions appear:

Action	Description
Create	Creates an aggregate in the NetApp ONTAP account.
Delete	Deletes an existing aggregate.
Online	Moves the aggregate to an online state.
Offline	Moves the aggregate to an offline state.
Add Disk	Adds a disk to the aggregate.
Manage Tags	Adds a tag to the aggregate, edits the assigned tag, and deletes the tag from the aggregate group. Note The tags for which the Taggable Entities are assigned as physical storage and NetApp aggregate are displayed. For more information on the tab library, see Cisco UCS Director Administration Guide.
Add Tags	Adds a tag to the aggregate. Note The tags for which the Taggable Entities are assigned as physical storage and NetApp aggregate are displayed. For more information on the tab library, see Cisco UCS Director Administration Guide.
Delete Tags	Deletes the tag(s) from the aggregate. Note The tags for which the Taggable Entities are assigned as physical storage and NetApp aggregate are displayed. For more information on the tab library, see Cisco UCS Director Administration Guide.

Creating an Aggregate

Procedure

- 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 NetApp ONTAP account and then click **View Details**.
- Step 5** Click **Filers**.
- Step 6** Click the row of a filer and then click **View Details**.

Step 7 On the **Storage Filer** page, click **Aggregates**.

Step 8 Click **Create**.

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

Name	Description
Aggregate Name field	Enter the name of the aggregate.
Disk Count field	Enter the number of disks in the aggregate.
Disk List check boxes	Check the boxes to select the disks.
Raid Type drop-down list	Choose the RAID type.

Step 10 Click **Submit**.

Managing Initiator Groups

Initiator groups (igroups) specify which hosts can access specified logical unit numbers (LUNs) on the storage system. Initiator groups are protocol-specific.

Procedure

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 NetApp ONTAP account and then click **View Details**.

Step 5 Click **Filers**.

Step 6 Click the row of a filer and then click **View Details**.

Step 7 On the **Storage Filer** page, click **Initiator Groups**.

When you choose an initiator group, the following additional actions appear:

Action	Description
View Details	Displays the service request details of the selected initiator group.
Create	Creates an initiator group in the NetApp ONTAP account.
Delete	Deletes the initiator group.
ALUA	Enables the Asymmetric Logical Unit Access (ALUA) protocol to identify optimized paths between a storage system and a host.

Creating an Initiator Group

Procedure

- 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 NetApp ONTAP account and then click **View Details**.
- Step 5** Click **Filers**.
- Step 6** Click the row of a filer and then click **View Details**.
- Step 7** On the **Storage Filer** page, click **Initiator Groups**.
- Step 8** Click **Create**.
- Step 9** On the **Create Initiator Group** screen, complete the following fields:

Name	Description
Initiator Group Name	Enter a unique name that you assign to this initiator group.
Group Type drop-down list	Choose the type of the initiator group from one of the following: • ISCSI • FCP
OSType drop-down list	Choose the OS type of the initiators within the group.
Portset field	Enter the name of a current port set to bind to the newly created igroup.

- Step 10** Click **Create**.

Creating an Initiator

An initiator is a part of an initiator group. You can add an initiator to an initiator group.

Procedure

- 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 NetApp ONTAP account and then click **View Details**.
- Step 5** Click **Filers**.
- Step 6** Click the row of a filer and then click **View Details**.
- Step 7** On the **Storage Filer** page, click **Initiators**.

Step 8 Click **Create**.

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

Name	Description
Initiator Group Name drop-down list	Choose the initiator group under which the initiator is to be added.
Initiator Name field	Enter a unique name that you assign to this initiator.
Force check box	Check this box to forcibly add the initiator to the group.

Step 10 Click **Create**.

Managing LUNs

A logical unit number (LUN) is used to identify a logical unit, which is a device that is addressed by the SCSI protocol or similar protocols such as Fibre Channel or iSCSI. LUNs are central to the management of block storage arrays shared over a storage area network (SAN).

Procedure

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 NetApp ONTAP account and then click **View Details**.

Step 5 Click **Filers**.

Step 6 Click the row of a filer and then click **View Details**.

Step 7 On the **Storage Filer** page, click **LUNs**.

When you choose a LUN, the following additional actions appear:

Action	Description
Create	Creates a LUN in the NetApp ONTAP account.
View Details	Displays summary and service request details of the LUN.
View Connectivity	Displays connectivity of the LUNs to Datastores. Cisco UCS Director provides the four types of view mode: Hierarchical, Concentric, Circular, and Force Directed. Depending on the view mode that you choose, you can adjust item spacing, distance, radius, rigidity, and force distance.
On/Off	Moves the LUN to the online or offline state.
UnMap iGroup	Unmaps the iGroup from the selected LUN.

Action	Description
Map iGroup	Maps the LUN to one of the existing initiator groups. Choose the iGroup from the Initiator Group drop-down list. Check the Specify LUN ID box to specify the LUN ID. If not specified, the system generates a LUN ID automatically.
Resize	Resizes the LUN. To resize the LUN, complete the following fields: a. New Size field—Enter the required size of the LUN. b. Size Unit drop-down list—Choose the size of the LUN as MB , GB , or TB .
Move	Moves the LUN to a new path.
Clone	Clones the LUN in another destination.
Modify ID	Changes the LUN ID.
Delete	Deletes the LUN.

Creating a LUN

Procedure

- 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 NetApp ONTAP account and then click **View Details**.
- Step 5** Click **Filers**.
- Step 6** Click the row of a filer and then click **View Details**.
- Step 7** On the **Storage Filer** page, click **LUNs**.
- Step 8** Click **Create**.
- Step 9** On the **Create LUN** screen, complete the following fields:

Name	Description
Select Volume list	Expand the volume list and choose the volume in which you want to create the LUN.
LUN Name field	Enter the name of the LUN.
LUN Size field	Enter the size of the LUN to be created.

Name	Description
Size Unit drop-down list	Choose the size of the volume as MB , GB , or TB .
OSType drop-down list	Choose the OS type from the list.
Space Reserve check box	By default, the LUN has a reserved space. Check this box to manage the space usage manually and to create a LUN without any space being reserved.

Step 10 Click **Create**.

Managing Volumes

A volume is a logical file system whose structure is made visible to users when you export the volume to a UNIX host through an NFS mount or to a Windows host through a CIFS share. A volume is the most inclusive of the logical containers. It can store files and directories, qtrees, and LUNs.

Procedure

- 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 NetApp ONTAP account and then click **View Details**.
- Step 5** Click **Filers**.
- Step 6** Click the row of a filer and then click **View Details**.
- Step 7** On the **Storage Filer** page, click **Volumes**.

When you choose a volume, the following additional actions appear:

Action	Description
View Details	Displays a summary of the volume including more details about the volume component: • Qtrees • LUNs • VMs • Snapshot • Service request details
Create	Creates a volume in the NetApp ONTAP account.
Delete	Deletes the volume.

Action	Description
Resize	Resizes an existing volume. To resize the volume, complete the following fields: a. New Size field—Enter the required size of the volume. b. Size Units drop-down list—Choose the size of the volume as MB, GB, or TB. c. File System Size Fixed check box—Check this box to fix the file system size.
Offline	Moves the volume to the offline state.
Online	Moves the volume to the online state.
Dedup On	Enables data deduplication on the volume.
Dedup Off	Disables data deduplication on the volume.
NFS Export	Exports the volume as a file through NFS. To export the volume, complete the following fields: a. Export Path field—Enter the path where the volume should be mounted in the UNIX environment. b. Read-Write Hosts field—Enter the comma-separated list of hosts that have read write access to the volume. c. Root Hosts field—Enter the comma-separated list of hosts that have root access to the volume. d. Security drop-down list—Choose the security applicable for this export. e. Persists NFS Export Rule check box—Check this check box to persist the NFS export rule.
Snapshot	Creates a snapshot for the volume. To create a snapshot of the volume, complete the following fields: a. Snapshot Name field—Enter the name of the Snapshot. b. Is Valid LUN Clone Snapshot check box—Check this box when the snapshot created has been requested by snapvault so that all backup snapshots for the LUN clones are locked. c. Async check box—Check this box to create the snapshot asynchronously.

Action	Description
Resize Snapshot	Resizes the snapshot space allocated on a volume. The space within a volume can be defined for the snapshots taken on a volume in terms of percentage. Current Snapshot Reserved (%)—<i>Display Only</i>. The current percentage of volume space reserved for snapshots. New Percentage (%)—Enter a different percentage of volume space to be reserved for snapshots.

Creating a Volume

Procedure

- 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 NetApp ONTAP account and then click **View Details**.
- Step 5** Click **Filers**.
- Step 6** Click the row of a filer and then click **View Details**.
- Step 7** On the **Storage Filer** page, click **Volumes**.
- Step 8** Click **Create**.
- Step 9** On the **Create Flexible Volume** screen, complete the following fields:

Name	Description
Aggregate list	Select an aggregate to create the volume.
Space Guarantee drop-down list	Choose one of the following as the space guarantee to allocate space for the volume in the aggregate: • Volume • File • None
Volume Name field	Enter the name of the volume.
Volume Size field	Enter the size of the volume to be created.
Size Unit drop-down list	Choose the size of the volume as MB , GB , or TB .
Snapshot Size (%) field	Enter the snapshot size as a percentage.

Name	Description
Security Style NTFS check box	Check this box to set the security style as NTFS.
NFS Export check box	Check this box to create the NFS export path automatically.

Step 10 Click **Create**.

Creating CIFS Shares

Procedure

- 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 NetApp ONTAP account and then click **View Details**.
- Step 5** Click **Filers**.
- Step 6** Click the row of a filer and then click **View Details**.
- Step 7** On the **Storage Filer** page, click **Volumes**.
- Step 8** Click the row of the volume where you want to create a CIFS share.
- Step 9** From the **More Actions** drop-down list, choose **Create CIFS Share**.
- Step 10** On the **Add CIFS Share** screen, complete the following fields:

Name	Description
Share Name field	Enter a unique name that you assign to the CIFS share.
Comment field	Enter comments, if any.

Step 11 Click **Share**.

Setting CIFS Share Access

Procedure

- 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 NetApp ONTAP account and then click **View Details**.
- Step 5** Click **Filers**.

- Step 6** Click the row of a filer and then click **View Details**.
- Step 7** On the **Storage Filer** page, click **Volumes**.
- Step 8** Click the row of the volume where you want to set CIFS share access.
- Step 9** From the **More Actions** drop-down list, choose **Set CIFS Share Access**.
- Step 10** On the **Set CIFS Share Access** screen, complete the following fields:

Name	Description
Share Name drop-down list	Choose the share for which you want to provide access.
Select Role drop-down list	Choose the role from the available list.
Role ID field	Enter a role ID.
Domain Name field	Enter a domain name.
Access Type drop-down list	Choose one of the following as the access type: • Read • Change • Full Control • No Access
Comment field	Enter comments, if any.

- Step 11** Click **Submit**.

Managing QOS Policy Groups

The QOS policy group allows you to control the resources that can be consumed by storage objects (such as volumes, LUNs, VMDKs, or SVMs) to manage network performance.

Procedure

- 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 NetApp OnCommand account and then click **View Details**.
- Step 5** Click **QOS Policy Groups**.
- When you choose a QOS policy group, the following additional actions appear:

Action	Description
Create	Creates a QOS policy group in the NetApp OnCommand account.
Modify	Changes the QOS policy group.
Delete	Deletes the QOS policy group.

Creating a QOS Policy Group

Procedure

- 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 NetApp OnCommand account and then click **View Details**.
- Step 5** Click **QOS Policy Groups**.
- Step 6** On the **Create QOS Policy Groups** screen, complete the following fields:

Name	Description
SVM field	Click Select to choose the SVM and click Select .
QOS Policy Group Name field	Enter the name of the QOS policy group.
Maximum Throughput field	Maximum transfer rate.
Unit of Throughput drop-down list	Choose the unit of transfer rate.

Managing SnapMirror Relationships

NetApp SnapMirror software is an enterprise-level disaster recovery and data distribution solution. SnapMirror mirrors data to one or more network filers at high speed over LAN or WAN connections.

Procedure

- 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 NetApp ONTAP account and then click **View Details**.

Step 5 Click **Filers**.

Step 6 Click the row of a filer and then click **View Details**.

Step 7 On the **Storage Filer** page, click **SnapMirrors**.

The following actions are available:

Action	Description
Create Connection	Sets up a new SnapMirror connection.
Delete Connection	Deletes a SnapMirror connection.
Remote Access	Provides access to a remote filer (source filer) to the destination volume.
Schedules	Creates a SnapMirror schedule.
Enable	Turns on SnapMirror.
Disable	Turns off SnapMirror.

Step 8 Click a row and the following additional actions appear:

Action	Description
Inventory	Runs a SnapMirror inventory.
View Details	Displays the status history and allows you to edit, delete, and run the inventory on a schedule.
Initialize	Initializes a SnapMirror relationship. After initializing a SnapMirror relationship, you get the following actions: • Quiesce—Pauses a transfer to the destination. • Break—Breaks the SnapMirror relationship. You cannot check whether the operation is legal, or whether it is successful. The result is updated after the inventory is collected in this task. • Update—Updates the SnapMirror relationship.
Delete	Deletes the SnapMirror relationship.

Configuring a SnapMirror Relationship

Procedure

- 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 NetApp ONTAP account and then click **View Details**.
- Step 5** Click **Filers**.
- Step 6** Click the row of a filer and then click **View Details**.
- Step 7** On the **Storage Filer** page, click **SnapMirrors**.
- Step 8** Click **Create Connection**.
- Step 9** On the **Configure** screen, complete the following fields:

Name	Description
Connection Name drop-down list	Choose the connection name to modify the connection. Choose New Connection to create a new connection.
New Connection Name field	If you have chosen to configure a new connection, enter the name of the connection in the field.
Mode drop-down list	Choose one of the following as the type of mode: • Multi • Failover Note In multi-mode, the first address pair provides a connection path. In failover mode, the first address pair provides the preferred connection path.
Source Address field	The source address in the form of the filer name or IP address in the Address Pair 1 and Address Pair 2 area.
Destination Address field	The destination address in the form of the filer name or IP address in the Address Pair 1 and Address Pair 2 area.

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

Scheduling a SnapMirror Relationship

Procedure

- 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 NetApp ONTAP account and then click **View Details**.
- Step 5** Click **Filers**.
- Step 6** Click the row of a filer and then click **View Details**.
- Step 7** On the **Storage Filer** page, click **SnapMirrors**.
- Step 8** Click **Schedules**.
- Step 9** On the **Schedules** screen, expand the **Schedule** list and then click **Add**.
- Step 10** On the **Add Entry to Schedule** screen, complete the following fields:

Name	Description
Source Location field	Expand the Source Location list and choose the source location of a schedule to set.
Select Option drop-down box	Choose one of the following options to choose either an existing volume or a new volume in the current filer or vFiler: • Existing Destination • New Destination
Destination Location drop-down box	Choose the destination location.
Minutes field	Minutes in the hour for which the schedule is set. Possible values are (-) = match nothing, (1) = match minute 1, (1,3) = match minute 1 and 3, and (*) = match all possible legal values.
Hours field	Hours in the day for which the schedule is set. Possible values are (-) = match nothing, (1) = match hour 1, (1,3) = match hour 1 and 3, and (*) = match all possible legal values.
Days of Month field	Days in the month for which the schedule is set. Possible values are (-) = match nothing, (1) = match day 1, (1,3) = match day 1 and 3, (2-5) = match day 2,3,4,5, and (*) = match all possible legal values.

Name	Description
Days of Week field	Days in the week for which the schedule is set. 0 represents Sunday, and 6 represents Saturday. Possible values are (-) = match nothing, (1) = match day 1 (Monday), (1,3) = match day 1 (Monday) and 3 (Wednesday), (2-5) = match day 2,3,4,5 (Tuesday to Friday), and (*) = match all possible legal values.
Max Transfer Rate (KB) field	Maximum transfer rate kilobytes per second.

Step 11 Click **Submit**.

Managing SnapVault Relationships

SnapVault is a collection of snapshot copies of the primary volume, which can be restored with minimal downtime when there is data loss or when a system is corrupted. The SnapVault relationships can be managed through the SnapMirrors tab.

Procedure

- 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 NetApp ONTAP account and then click **View Details**.
- Step 5** Click **Filers**.
- Step 6** Click the row of a filer and then click **View Details**.
- Step 7** On the **Storage Filer** page, click **SnapVault**.

When you choose a SnapVault relationship, the following additional actions appear:

Action	Description
View Details	Displays information about the current status of the selected component.
Create	Sets up a new SnapVault relationship.
Modify	Updates an existing SnapVault relationship.
Delete	Deletes the SnapVault relationship.
Release	Releases the SnapVault relationship.
Abort	Aborts the SnapVault transfer before it is complete.
Update	Starts a fresh SnapVault transfer.

Action	Description
Restore	Restores the previous SnapVault relationship.

Creating a SnapVault Relationship

Procedure

- 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 NetApp ONTAP account and then click **View Details**.
- Step 5** Click **Filers**.
- Step 6** Click the row of a filer and then click **View Details**.
- Step 7** On the **Storage Filer** page, click **SnapVault**.
- Step 8** Click **Create**.
- Step 9** On the **Create SnapVault** screen, complete the following fields:

Name	Description
Source Path drop-down list	Choose the source QTree from which the data has to be transferred.
Destination Volume drop-down list	Choose the destination volume to which the data has to be copied.
New Destination QTree Name field	Enter the new destination QTree name to which the data has to be copied. The new QTree will be created in the selected destination volume.
Maximum Transfer Rate field	Optionally, you can enter the number of kilobytes that can be transferred.
Tries Count field	Specify the maximum number of tries to connect to the source volume before giving up.
Connection Mode field	Specify the IP connection mode when the source is contacted for transfer.
Use Compression field	Set this option to On when the data transferred from the source is compressed.

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

Viewing Schedules and Status History of SnapVault Relationships

You can also view the schedules and status history of a SnapVault relationships through **SnapMirrors**. See [Managing SnapMirror Relationships, on page 62](#).

Procedure

-
- 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 NetApp ONTAP account and then click **View Details**.
 - Step 5** Click **Filers**.
 - Step 6** Click the row of a filer and then click **View Details**.
 - Step 7** On the **Storage Filer** page, click **SnapVault**.
 - Step 8** Click the row of the SnapVault relationship for which you want to view the schedules and status history and then click **View Details**.
 - Step 9** From the **More Reports** drop-down list, choose one of the following reports:
 - **Schedules**
 - **Status History**
-

Managing QTrees and Creating Quotas

A QTree is similar in concept to a partition. It creates a subset of a volume to which a quota can be applied to limit its size. As a special case, a QTree can be the entire volume. A QTree is more flexible than a partition because you can change the size of a QTree at any time.

Procedure

-
- 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 NetApp ONTAP account and then click **View Details**.
 - Step 5** Click **Filers**.
 - Step 6** Click the row of a filer and then click **View Details**.
 - Step 7** On the **Storage Filer** page, click **Qtrees**.
When you choose a QTree, the following additional actions appear:

Action	Description
Delete	Deletes a QTree after confirmation.
Create Quota	Creates a quota in the QTree. To create a quota, complete the following fields: • Disk Space Hard Limit (GB)—Enter the maximum disk space value in GB. • Disk Space Soft Limit (GB)—Enter the soft limit disk space value in GB. • Files Hard Limit—Enter the maximum number of files in the quota. • Files Soft Limit—Enter the soft limit for the number of files in the quota. • Threshold (GB)—Enter the threshold limit disk space value in GB. • Quota Type—Choose Tree from the drop-down list.

Creating a QTree

Procedure

- 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 NetApp ONTAP account and then click **View Details**.
- Step 5** Click **Filers**.
- Step 6** Click the row of a filer and then click **View Details**.
- Step 7** On the **Storage Filer** page, click **Volumes**.
- Step 8** Click the row of the volume where you want to create a QTree.
- Step 9** From the **More Actions** drop-down list, choose **Create QTree**.
- Step 10** On the **Create QTree** screen in the **QTree Name** field, enter the name of the QTree.
- Step 11** Click **Create**.

Managing System Tasks

A multi-node setup improves scalability by offloading the processing of system tasks, such as inventory data collection, from the primary node to one or more service nodes. You can assign certain system tasks to one or more service nodes. The number of nodes determines how the processing of system tasks are scaled.

Procedure

-
- 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 NetApp ONTAP account and then click **View Details**.
 - Step 5** Click **System Tasks**.

The tasks that are defined for the account are displayed. For more information about how to manage system tasks, see the [Cisco UCS Director Administration Guide](#).



CHAPTER 6

Monitoring and Reporting for a Cluster Mode Account

This chapter contains the following sections:

- [About Monitoring and Reporting for a Cluster Mode Account, on page 71](#)
- [About Cluster Mode Account and Nodes, on page 72](#)
- [About Disks, on page 73](#)
- [Managing Logical Interfaces, on page 73](#)
- [Configuring a Port, on page 77](#)
- [Managing Interface Groups, on page 77](#)
- [Managing VLANs, on page 79](#)
- [Managing Aggregates, on page 80](#)
- [Managing SVMs, on page 82](#)
- [Managing FCP Services, on page 109](#)
- [Creating and Managing SVM Peers, on page 111](#)
- [Creating a Cluster Peer, on page 111](#)
- [Managing SnapMirror and SnapVault Relationships, on page 112](#)
- [Managing SnapMirror Policies, on page 114](#)
- [Managing Snapshot Policies, on page 116](#)
- [Managing Jobs, on page 117](#)
- [Managing Cron Job Schedules, on page 118](#)
- [Managing NFS Services, on page 119](#)
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- [Managing C-Mode Licenses, on page 121](#)
- [Selecting an API for NetApp Management, on page 122](#)

About Monitoring and Reporting for a Cluster Mode Account

Cisco UCS Director displays all managed components in each NetApp Cluster Mode (C-Mode) account. These components can be hardware or software.

Components You Can Monitor

You can monitor each component and perform tasks such as creating, deleting, and modifying these components. The following components are monitored in a C-Mode account:

- Nodes
- SVMs
- IPspaces
- Aggregates
- SVM Peer
- Cluster Peer
- SnapMirrors
- SnapMirror Policies
- Jobs
- FailOver Groups
- Disks
- FC Adapters
- Snapshot Policies
- Routing Group Routes
- Logical Interfaces (LIFs)
- Ports
- Interface Groups
- vLANs
- Licenses
- Cron Job Schedules
- NFS Services
- FCP Services
- System Tasks

About Cluster Mode Account and Nodes

Clustered Data ONTAP is the enabler for NetApp scale-out storage configurations. The basic building blocks of a cluster are the familiar NetApp HA pairs in which two storage controllers are interconnected to the same set of disks. If one controller suffers a failure, the other takes over its storage and continues serving data.

In a Data ONTAP cluster, each storage controller is referred to as a cluster node, and nodes are allowed to be of different models and sizes. In a cluster, it is connected to other nodes over a cluster network.

A node is also connected to the disk shelves that provide physical storage for the Data ONTAP Cluster-Mode system or to third-party storage arrays that provide array LUNs for Data ONTAP use.

About Disks

Disks are grouped together in an aggregate. These aggregates provide storage to the volumes that are associated with the aggregate.

When you click **Disks**, all the disks that are available in that account are displayed. Click the row of the disk and then click **View Details** to view the summary details of the disk.

Managing Logical Interfaces

A logical interface (LIF) is an IP address associated with a physical network port; that is, an Ethernet port. In the event of a component failure, a logical interface can failover or be migrated to a different physical port (potentially on other nodes) based on policies interpreted by the LIF manager. A LIF continues to provide network access despite the component failure. You can create multiple LIFs for a single SVM.

Procedure

- 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 that includes the NetApp C-Mode account and then click **View Details**.
- Step 5** Click **Logical Interfaces**.

When you choose a LIF, the following additional actions appear:

Action	Description
Delete	Deletes the selected LIF.
Set FCP Portname	Sets the FCP adapter port name for the LIF.
Create LIF	Creates a logical interface on a single SVM.
Modify LIF	Updates the following values of the LIF: home node, IP address, subnet mask, and failover policy.
Migrate LIF	Migrates a logical interface to a port or interface group on the node that you specify. Choose the Node Name and Port Name from the respective drop-down lists.
Modify Status	Modifies the existing status of the LIF. The status can be up or down .

Creating a Logical Interface

Procedure

- 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 that includes the NetApp C-Mode account and then click **View Details**.
- Step 5** Click **Logical Interfaces**.
- Step 6** Click **Create LIF**.
- Step 7** On the **Create LIF** screen, complete the following fields:

Name	Description
Role drop-down list	Choose any one of the following as a role of the LIF: • Data • Intercluster • Cluster Management
SVM Name list	Choose an SVM from the list.
Home Node list	Choose a node from the list.
Allowed Protocols list	Choose the allowed protocols from the following list: • NFS • CIFS • iSCSI • FCP
Home Port drop-down list	Choose a port from the list.
Logical Interface Name field	Enter the name of the logical interface.
IP Address field	Enter the IP address of the network.
Subnetmask field	Enter the subnet mask of the network.

Name	Description
Failover Policy drop-down list	Choose the failover policy for the LIF: • nextavail • disabled • priority Note For iSCSI and FCP LIFs, the failover policy is Disabled. For CIFS LIFs, the default policy is Nextavail.
Use Failover Group drop-down list	Choose the failover group type to specify whether the failover rules are system defined, manually created by the administrator, or disabled: • system-defined • enabled • disabled
Failover Group drop-down list	Choose the failover group to specify the failover group created by the administrator. This field is applicable only when Enabled is selected as the Use Failover Group.
NFS Service Start check box	Check this box to start the NFS service on the SVM. This field is displayed when NFS is selected from the Allowed Protocols list.
Is NFS Access Enabled	Check this box to enable NFS access. This field is displayed only when NFS Service Start is checked.
Is Vstorage Enabled	Check this box to enable Vstorage. This field is displayed only when NFS Service Start is checked.
FCP Service Start	Check this box to start the FCP service on the SVM. This field is displayed when FCP is selected from the Allowed Protocols list.
FCP Target Node Name	Enter the World Wide Node Name (WWNN) that is used to identify the FC node. This field is displayed only when FCP Service Start is checked.
CIFS Setup	Check this box to setup CIFS on the SVM. This field is displayed when CIFS is selected from the Allowed Protocols list.

Name	Description
CIFS Server	Enter a name for the CIFS server. This field is displayed only when CIFS Setup is checked.
Domain Name	The name of the domain that the CIFS server will join. It can be NetBIOS or any fully qualified domain name of the active directory, such as cifsdomain or cifs.domain.com. This field is displayed only when CIFS Setup is checked.
Admin User	The name of the admin user who has the ability to add the CIFS server to the domain given in the Domain Name field. This field is displayed only when CIFS Setup is checked.
Admin Password	The password of the admin user. This field is displayed only when CIFS Setup is checked.
Organizational Unit field	The distinguished name of the organizational unit that the CIFS service will become a member of. By default, the filer will join the 'CN=Computers' organizational unit. This field is displayed only when CIFS Setup is checked.
Schema drop-down list	Choose the LDAP schema from the list. This field is displayed only when CIFS Setup is checked.
IP Address	Enter a comma-separated list of LDAP IP addresses. This field is displayed only when CIFS Setup is checked.
iSCSI Service Start	Check this box to start the iSCSI service on the SVM. This field is displayed when iSCSI is selected from the Allowed Protocols list.
Alias Name	Enter the iSCSI target alias name for the iSCSI service. This field is displayed only when iSCSI Service Start is checked.
iSCSI Node Name	Enter the iSCSI target node name for the SVM. The name must start with the prefix "iqn". This field is displayed only when iSCSI Service Start is checked.

Step 8Click **Submit**.

Configuring a Port

Ports are either physical ports (NICs), or virtualized ports, such as interface groups or VLANs. A LIF communicates over the network through the port to which it is currently bound.

Procedure

- 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 that includes the NetApp C-Mode account and then click **View Details**.
- Step 5** Click **Ports**.
- Step 6** Select the row of a port that you want to configure and then click **Configure Port**.
- Step 7** On the **Configure Port** screen, complete the following fields:

Name	Description
Administrative speed drop-down list	Choose the administrative speed.
Role drop-down list	Choose the role.
Admin status enable check box	Check this box to enable the administrative status.
MTU field	Enter the maximum transfer unit (MTU) of the port.

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

Managing Interface Groups

An interface group is a port aggregate that contains two or more physical ports that act as a single trunk port. Expanded capabilities include increased resiliency, increased availability, and load sharing.

Procedure

- 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 that includes the NetApp C-Mode account and then click **View Details**.
- Step 5** Click **Interface Groups**.
When you choose an interface group, the following additional actions appear:

Action	Description
Create	Creates a new interface group.
Delete	Deletes an interface group.
Add Port	Adds a port to the interface group.
Remove Port	Removes a port from the interface group.

Creating Interface Groups

Procedure

- 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 that includes the NetApp C-Mode account and then click **View Details**.
- Step 5** Click **Interface Groups**.
- Step 6** Click **Create**.
- Step 7** On the **Create IfGroup** screen, complete the following fields:

Name	Description
Node Name drop-down list	Choose the node name in which an interface group needs to be created.
Interface Group Name field	Enter the name of the interface group. Note The allowable format of the interface group name is <letter><number><letter>. The name should start with the letter 'a'.
Distribution Function drop-down list	Choose one of the following options as the distribution function of the port interface group: • Mac • IP • Sequential • Port

Name	Description
Create Policy drop-down list	Choose one of the following options as the create policy for the interface group: • Multimode • Multimode LCAP • Singlemode

Step 8 Click **Submit**.

Managing VLANs

VLANs provide logical segmentation of networks by creating separate broadcast domains. A VLAN can span multiple physical network segments.

Procedure

- 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 that includes the NetApp C-Mode account and then click **View Details**.
- Step 5** Click **vLANs**.

When you choose a VLAN, the following additional actions appear:

Action	Description
Create	Creates a VLAN on one of the node in a cluster account.
Delete	Deletes a VLAN interface.

Creating vLANs

Procedure

- 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 that includes the NetApp C-Mode account and then click **View Details**.

Step 5 Click **vLANs**.

Step 6 Click **Create**.

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

Name	Description
Node Name drop-down list	Choose a node in which the VLAN needs to be created.
Port Name drop-down list	Choose the port or interface group name.
vLAN ID field	Enter the VLAN ID. The valid range of the VLAN ID is from 1 to 4094.

Step 8 Click **Submit**.

Managing Aggregates

An aggregate is made up of one or more RAID groups of disks. Aggregates are used to manage plexes and RAID groups as these entities exist as part of an aggregate. You can increase the usable space in an aggregate by adding disks to existing RAID groups or by adding new RAID groups. After you have added disks to an aggregate, you cannot remove them to reduce storage space without deleting the aggregate.

Procedure

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 that includes the NetApp C-Mode account and then click **View Details**.

Step 5 Click **Aggregates**.

When you choose an aggregate, the following additional actions appear:

Action	Description
Create	Creates an aggregate on a selected node.
Delete	Deletes the selected aggregate.
Online	Moves the aggregate to an online state.
Offline	Moves the aggregate to an offline state.
Add Disk	Adds a disk to the aggregate.

Action	Description
Manage Tags	Adds a tag to the aggregate, edits the assigned tag, and deletes the tag from the aggregate group. Note The tags for which the Taggable Entities are assigned as physical storage and NetApp aggregate are displayed. For more information on the tab library, see Cisco UCS Director Administration Guide.
Add Tags	Adds a tag to the aggregate. Note The tags for which the Taggable Entities are assigned as physical storage and NetApp aggregate are displayed. For more information on the tab library, see Cisco UCS Director Administration Guide.
Delete Tags	Deletes a tag(s) from the aggregate. Note The tags for which the Taggable Entities are assigned as physical storage and NetApp aggregate are displayed. For more information on the tab library, see Cisco UCS Director Administration Guide.

Creating an Aggregate

Procedure

- 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 that includes the NetApp C-Mode account and then click **View Details**.
- Step 5** Click **Aggregates**.
- Step 6** Click **Create**.
- Step 7** On the **Create Aggregate** screen, complete the following fields:

Name	Description
Aggregate Name field	Enter the name of the aggregate.
Disk Count field	Enter the number of disks in the aggregate.
Node Name list	Choose the nodes on which to create the aggregate.
Disk List list	Choose the disks to be aggregated.

Name	Description
Raid Type drop-down list	Choose the RAID type from the list.

Step 8 Click **Submit**.

Managing SVMs

Storage Virtual Machine (SVM), formerly known as Vserver, is a secure virtual storage server that supports multiple protocols and unified storage. Each SVM contains data volumes and one or more Logical Interfaces (LIFs) through which it serves data to the clients. SVMs securely isolate the shared virtualized data storage and network and appear as a single dedicated server to the clients. Each SVM has a separate administrator authentication domain and can be managed independently by its SVM administrator.

Procedure

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 that includes the NetApp C-Mode account and then click **View Details**.

Step 5 Click **SVMs**.

When you choose an SVM, the following additional actions appear:

Action	Description
Create	Creates SVM on one of the nodes in a cluster account.
Modify	Updates an existing SVM.
Delete	Deletes an existing SVM.
Start	Starts the SVM.
Stop	Stops the SVM.

Action	Description
Create Routing Group Route	Creates a routing group. To create a routing group, complete the following fields: • SVM Name list—Choose the SVM. • Routing Group field—Enter the name for the routing group. For example, d192.168.1.0/24 (where d, c, and n stands for data, cluster, node LIF and 192.168.1.0/24 is the subnet). • Gateway Address field—Enter the IP address of the gateway. For example, 192.168.1.1. • Destination Address field—Enter the IP address and subnet mask of the destination. For example, 192.168.1.0/24. • Metric field—Enter the metric (hop count) of the LIF.
Start NFS Service	Starts the NFS service.
Stop NFS Service	Stops the NFS service.
Start FCP Service	Starts the FCP service.
Stop FCP Service	Stops the FCP service.
Start ISCSI Service	Starts the ISCSI service.
Stop ISCSI Service	Stops the ISCSI service.
Setup CIFS	Sets up the CIFS for the SVM.
Modify CIFS	Updates the CIFS set for the SVM.
Delete CIFS	Deletes the CIFS set for the SVM.
Assign Group	Assigns the SVM to a user or user group.
Manage Tag	Adds a tag to the SVM, edits the assigned tag, and deletes the tag from the SVM group. Note The tags for which the Taggable Entities are assigned during creation are displayed. For more information on the tab library, see Cisco UCS Director Administration Guide.
Add Tags	Adds a tag to the aggregate. Note The tags for which the Taggable Entities are assigned during creation are displayed. For more information on the tab library, see Cisco UCS Director Administration Guide.

Action	Description
Delete Tags	Deletes the tag(s) from the aggregate. Note The tags for which the Taggable Entities are assigned during creation are displayed. For more information on the tag library, see Cisco UCS Director Administration Guide.

Creating SVMs

Procedure

- 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 that includes the NetApp C-Mode account and then click **View Details**.
- Step 5** Click **SVMs**.
- Step 6** Click **Create**.
- Step 7** On the **Create SVM** screen, complete the following fields:

Name	Description
SVM Name field	Enter the name of the SVM. The name should start with a letter or an underscore.
Name Service Switch drop-down list	Choose the name service switch.
Volume Name field	Enter the name of the root volume in which the SVM metadata needs to be stored.
Aggregate Name drop-down list	Choose the aggregate name in which the volume needs to be created.
Security Style drop-down list	Choose the security style.
Protocols check box	Check the box to choose one or all of the protocols that the SVM supports: • NFS • CIFS • iSCSI • FCP
Snapshot Policy list	Choose a snapshot policy for the SVM.

Name	Description
IPSpace Name list	Choose an IPSpace for the SVM.

Step 8 Click **Submit**.

What to do next

Click the row for the new SVC and then, from the **More Actions** drop-down list, choose **View Details** to view details about the SVM. You can also set up, modify, and delete CIFS for that SVM.

Managing Volumes in SVM

A volume is a logical file system whose structure is made visible to users when you export the volume to a UNIX host through an NFS mount or to a Windows host through a CIFS share. A volume is the most inclusive of the logical containers. It can store files and directories, Qtrees, and LUNs.

Procedure

- 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 that includes the NetApp C-Mode account and then click **View Details**.
- Step 5** Click **SVMs**.
- Step 6** Click the row of the SVM and then, from the **More Actions** drop-down list, choose **View Details**.
- Step 7** Click **Volumes**.

When you choose a volume, the following additional actions appear:

Action	Description
Create	Creates a volume in the NetApp C-Mode account.
Modify	Updates an existing volume.
Delete	Deletes a volume.
Online	Moves a volume to an online state.
Offline	Moves a volume to an offline state.

Action	Description
Resize	Resizes the volume. To resize the volume, complete the following fields: Current Volume Size (GB)—<i>Display Only</i>. The current size of the volume in GB. New Size field—The required size of the volume. Size Unit drop-down list—Choose the size of the volume as MB, GB, or TB.
Clone Volume	Clones the volume. On the Clone Cluster Volume screen, enter the volume name and choose the parent snapshot.
Create Multi-Snapshot	Creates a multi-snapshot for the volume. To create a multi-snapshot, do the following on the Create Multi-Volume Snapshot screen: - Expand the Volumes Names list, and choose the volumes. - In the Snapshot Name field, enter a name for the snapshot. - Click Submit.
Move	Moves the volume to the selected aggregate.
Mount	Mounts the volume on the specified junction path. The junction path should start with / and should not end with /.
Unmount	Unmounts the volume.
Enable Dedupe	Enables data deduplication on the volume to remove duplicate entries.
Disable Dedupe	Disables data deduplication.
Start Dedupe	Starts the data deduplication on the volume to remove duplicate entries.
Stop Dedupe	Stops the data deduplication.

Action	Description
Modify Compression Status	Modifies the compression status. You can modify the compression status only when data deduplication is enabled. To modify the compression status, do the following on the Modify Compression Status screen: Enable Background Compression check box— Check this check box to enable background compression. This option is checked when you check the Enable Inline Compression check box. Enable Inline Compression check box— Check this check box to enable inline compression. - Click Submit.
Create QTree	Creates a QTree in the NetApp C-Mode account.
Create FlexGroup	Creates a FlexGroup in the NetApp C-Mode account.
Delete FlexGroup	Deletes a FlexGroup.
Configure Storage QOS	Configures a volume with a QOS policy group within the SVM. If you deselect a QOS policy group, the QOS policy group is unassigned from the volume. Click Select to choose a QOS policy group and click Select.
Assign to Group	Assigns user to group. To assign a user, complete the following fields: Assign to Users check box—Check this box to assign resource to the user. User Group ID field—Click Select to choose a group and click Select. Comments field—Specify your comments.
Unassign from Group	Unassigns SVM from a group.

Creating a Volume within SVM

Procedure

- 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 that includes the NetApp C-Mode account and then click **View Details**.
- Step 5** Click **SVMs**.
- Step 6** Click the row of the SVM and then, from the **More Actions** drop-down list, choose **View Details**.
- Step 7** Click **Volumes**.
- Step 8** Click **Create**.
- Step 9** On the **Create Volume** screen, complete the following fields:

Name	Description
Volume Type drop-down list	Choose the type of volume.
Volume Name field	Enter the name of the volume.
Volume Size field	Enter the size of the volume to be created.
Aggregate Name drop-down list	Choose an aggregate from the list.
Volume State drop-down list	Choose the state of the volume.
Volume Size Units drop-down list	Choose the size of the volume as MB , GB , or TB .
Space Guarantee drop-down list	Choose the guaranteed space from the list.
Security Style drop-down list	Choose the security style.
Snapshot Size (%) field	Enter the snapshot size as a percentage to be used by the volume.
Export Policy drop-down list	Choose the export policy.
Snapshot Policy list	Expand the list and choose a snapshot policy for the volume.

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

Creating a FlexGroup Volume within SVM

Procedure

- 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 that includes the NetApp C-Mode account and then click **View Details**.
- Step 5** Click **SVMs**.
- Step 6** Click the row of the SVM and then, from the **More Actions** drop-down list, choose **View Details**.
- Step 7** Click **Volumes**.

Step 8 Click **Create FlexGroup**.

Step 9 On the **Create FlexGroup Volume** screen, complete the following fields:

Name	Description
FlexGroup Name field	Enter the name of the FlexGroup.
Auto Provision check box	Check this check box to automatically select the existing aggregates for provisioning the FlexGroup volumes. By default, this check box is checked. Uncheck to manually select the aggregates.
Aggregate Name field	Click Select to choose the aggregates for provisioning the FlexGroup and click Select . This field is displayed when Auto Provision is unchecked.
FlexGroup Size field	Enter the size of the FlexGroup to be created.
FlexGroup Size Units drop-down list	Choose the size of the FlexGroup as MB , GB , TB , or PB .
Volume Type drop-down list	Choose the type of volume.
Volume State drop-down list	Choose the state of the volume.
Security Style drop-down list	Choose the security style.
Space Guarantee drop-down list	Choose the guaranteed space from the list.
Snapshot Size (%) field	Enter the snapshot size as a percentage to be used by the volume.
Snapshot Policy list	Click Select to choose the snapshot policy for the volume and click Select .
Export Policy drop-down list	Click Select to choose the export policy for the volume and click Select .

Step 10 Click **Submit**.

Managing Volume LIF Association

Procedure

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 that includes the NetApp C-Mode account and then click **View Details**.

- Step 5** Click **SVMs**.
- Step 6** Click the row of the SVM and then, from the **More Actions** drop-down list, choose **View Details**.
- Step 7** Click **Volume LIF Association**.

Managing LUNs

A logical unit number (LUN) is used to identify a logical unit, which is a device that is addressed by the SCSI protocol or similar protocols such as Fibre Channel or iSCSI. LUNs are central to the management of block storage arrays shared over a storage area network (SAN).

Procedure

- 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 that includes the NetApp C-Mode account and then click **View Details**.
- Step 5** Click **SVMs**.
- Step 6** Click the row of the SVM and then, from the **More Actions** drop-down list, choose **View Details**.
- Step 7** Click **LUNs**.

When you choose a LUN, the following additional actions appear:

Action	Description
Create	Creates a LUN in the NetApp C-mode account.
Delete	Deletes a LUN. On the Destroy LUN screen, check the Force box to allow a force deletion of the LUN.
Resize	Resizes the LUN within the volume. To resize the LUN, complete the following fields: a. LUN Size field—Enter the required size of the LUN. b. Size Units drop-down list—Choose the size of the LUN as MB , GB , or TB .
Clone	Clones a source LUN to a destination LUN within the same volume. Starts the LUN clone operation asynchronously. To clone the LUN, complete the following fields: a. Snapshot Clone check box—Check this box to clone the LUN from the snapshot. b. New LUN Name field—Enter the new LUN name.

Action	Description
Migrate	Moves a LUN from one volume to another within the same SVM. To move the LUN, do the following on the Migrate Cluster LUN screen: Select Destination Volume field—Click Select to choose the destination volume for the LUN and click Select. Promote Late check box—Check this check box if you want the LUN to be displayed in the destination volume only after completely moving the LUN from the source volume. Maximum Transfer Rate field—Enter the maximum transfer rate. The default value is zero. The maximum value is 4095 TB. Unit of Transfer Rate drop-down list—Choose the unit for data transfer rate.
Offline/Online	Moves LUN to the online or offline state.
Map iGroup	Maps the LUN to one of the existing initiator groups. Choose the Initiator Group (iGroup) from drop-down list. Check the Specify LUN ID box to specify the LUN ID; otherwise, the system generates a LUN ID automatically.
Unmap iGroup	Unmaps the iGroup for the selected LUN after confirmation.
Toggle Space Reservation	Enables or disables space reservation settings for the selected LUN.
View Details	Displays a summary of the LUN.
Configure Storage QOS	Configures a LUN with a QOS policy group within the SVM. If you deselect a QOS policy group, the QOS policy group is unassigned from the LUN. Click Select to choose a QOS policy group and click Select.

Creating a LUN

Procedure

- 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 that includes the NetApp C-Mode account and then click **View Details**.
- Step 5** Click **SVMs**.
- Step 6** Click the row of the SVM and then, from the **More Actions** drop-down list, choose **View Details**.
- Step 7** Click **LUNs**.
- Step 8** Click **Create**.
- Step 9** On the **Create LUN** screen, complete the following fields:

Name	Description
Select Volume drop-down list	Choose the volume to which the LUN belongs.
LUN Name field	Enter the name of the LUN.
Size field	Enter the required size of the LUN to be created.
Size Units drop-down list	Choose the size of the volume as MB , GB , or TB .
OS Type drop-down list	Choose a type of an operating system from the list.

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

Managing Qtrees

A QTree is similar in concept to a partition. It creates a subset of a volume to which a quota can be applied to limit its size. As a special case, a QTree can be the entire volume. A QTree is more flexible than a partition because you can change the size of a QTree at any time.

Procedure

- 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 that includes the NetApp C-Mode account and then click **View Details**.
- Step 5** Click **SVMs**.
- Step 6** Click the row of the SVM and then, from the **More Actions** drop-down list, choose **View Details**.
- Step 7** Click **QTrees**.

When you choose a QTree, the following additional actions appear:

Action	Description
Rename	Renames the QTree.
Modify	Updates the oplocks and security style of the QTree.
Delete	Deletes a QTree after confirmation.

Action	Description
Create QTree	Creates a QTree.

Creating QTrees

Procedure

-
- 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 that includes the NetApp C-Mode account and then click **View Details**.
- Step 5** Click **SVMs**.
- Step 6** Click the row of the SVM and then, from the **More Actions** drop-down list, choose **View Details**.
- Step 7** Click **QTrees**.
- Step 8** Click **Create QTree**.
- Step 9** On the **Create QTree** screen, do the following:
- Expand the **Volume Name** list and then choose the volume in which you want to create the QTree.
 - In the **QTree Name** field, enter the name of the QTree.
- Step 10** Click **Submit**.
-

Managing Quotas

A quota limits the amount of disk space and the number of files that a particular user or group can consume. A quota can also restrict the total space and files used in a QTree, or the usage of users and groups within a QTree.

Procedure

-
- 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 that includes the NetApp C-Mode account and then click **View Details**.
- Step 5** Click **SVMs**.
- Step 6** Click the row of the SVM and then, from the **More Actions** drop-down list, choose **View Details**.
- Step 7** Click **Quotas**.
- When you choose a quota, the following additional actions appear:

Action	Description
Create Quota	Creates a quota for a QTree in the SVM account.
Modify	Updates the quota of the QTree.
Remove	Removes quota of the QTree after confirmation.

Creating a Quota

Procedure

- 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 that includes the NetApp C-Mode account and then click **View Details**.
- Step 5** Click **SVMs**.
- Step 6** Click the row of the SVM and then, from the **More Actions** drop-down list, choose **View Details**.
- Step 7** Click **Quotas**.
- Step 8** Click **Create Quota**.
- Step 9** On the **Create Quota** screen, complete the following fields:

Name	Description
Quota Type drop-down list	Choose the type of quota. You can choose Tree , User , or Group from the drop-down list.
Volume Name field	Click Select to choose a volume for which the quota needs to be created and click Select . This field is displayed when you choose User or Group option from the Quota Type drop-down list .
QTree Name field	Click Select to choose a QTree, user, or group for which the quota needs to be created and click Select .
User drop-down list	Choose the user type for the quota. You can associate quota to all users or a specific user.
Specify User field	Enter the user name to which you want to associate the quota. This field is displayed when you choose Specific User option from the User drop-down list .

Name	Description
Perform User Mapping check box	Check the check box to map a Unix user to the corresponding Windows user. If the check box is checked, the UNIX user name (specified as the user) is mapped to the corresponding Windows user name or vice-versa, and quota accounting is performed for the users together. This field is displayed when you choose Specific User option from the User drop-down list .
Group drop-down list	Choose the group type for the quota. You can associate quota to all groups or a specific group.
Specify Group field	Enter the group name to which you want to associate the quota. This field is displayed when you choose Specific Group option from the Group drop-down list .
Disk Space Hard Limit (GB) field	Enter the maximum disk space value in GB.
Files Hard Limit field	Enter the maximum number of files.
Threshold GB field	Enter the threshold limit for the disk space value in GB.
Disk Space Soft Limit GB field	Enter the warning limit for the disk space value in GB.
Files Soft Limit field	Enter the soft limit for the number of files.

Managing Initiator Groups

Initiator groups (iGroups) specify which hosts can access specified LUNs on the storage system. Initiator groups are protocol-specific.

Procedure

- 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 that includes the NetApp C-Mode account and then click **View Details**.
 - Step 5** Click **SVMs**.
 - Step 6** Click the row of the SVM and then, from the **More Actions** drop-down list, choose **View Details**.
 - Step 7** Click **Initiator Groups**.
- When you choose an initiator group, the following additional actions appear:

Action	Description
Create	Creates an initiator group.
Delete	Deletes an initiator group.
Rename	Renames an initiator group.
Bind Portset	Chooses the port sets to bind with the iGroup.
Unbind Portset	Chooses the port sets to unbind from the iGroup.

Creating an Initiator Group

Procedure

- 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 that includes the NetApp C-Mode account and then click **View Details**.
- Step 5** Click **SVMs**.
- Step 6** Click the row of the SVM and then, from the **More Actions** drop-down list, choose **View Details**.
- Step 7** Click **Initiator Groups**.
- Step 8** Click **Create**.
- Step 9** On the **Create Initiator Group** screen, complete the following fields:

Name	Description
Initiator Group Name field	Enter the name of the initiator group.
Group Type drop-down list	Choose ISCSI or FCP as the initiator group type.
OS Type drop-down list	Choose the type of the operating system from the list.
Portset Name list	Expand the list and choose a port set from the table.

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

Managing Initiators

Procedure

- 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 that includes the NetApp C-Mode account and then click **View Details**.
- Step 5** Click **SVMs**.
- Step 6** Click the row of the SVM and then, from the **More Actions** drop-down list, choose **View Details**.
- Step 7** Click **Initiators**.

When you choose an initiator, the following additional actions appear:

Action	Description
Create	Adds an initiator to an initiator group.
Delete	Removes an initiator. Check the Force box to force delete the initiator. Note You cannot delete an initiator if LUN maps exist for the initiator group.

Creating an Initiator

Procedure

- 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 that includes the NetApp C-Mode account and then click **View Details**.
- Step 5** Click **SVMs**.
- Step 6** Click the row of the SVM and then, from the **More Actions** drop-down list, choose **View Details**.
- Step 7** Click **Initiators**.
- Step 8** Click **Create**.
- Step 9** On the **Create Initiator** screen, complete the following fields:

Name	Description
Initiator Group Name drop-down list	Choose the initiator group under which the initiator is to be created.

Name	Description
Initiator Name field	Enter the name of the initiator.
WWPN Alias list	Expand the list and check the box of the WWPN alias for the initiator.
Force check box	Check this box to forcibly add the initiator.

Step 10 Click **Submit**.

Managing CIFS Shares

The CIFS protocol is used with Microsoft operating systems for remote file operations (mapping network drives), browsing (through the network neighborhood icon), authentication (Windows NT and Windows 2000), and remote printer services. The core of native Microsoft networking is built around its CIFS services.

Procedure

- 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 that includes the NetApp C-Mode account and then click **View Details**.
- Step 5** Click **SVMs**.
- Step 6** Click the row of the SVM and then, from the **More Actions** drop-down list, choose **View Details**.
- Step 7** Click **CIFS Shares**.

When you choose a CIFS share, the following additional actions appear:

Action	Description
Create	Creates a CIFS share in the NetApp C-Mode account.
Delete	Deletes a CIFS share.
Modify	Updates the volume path and comment of the CIFS share.
Set Share Access	Creates a CIFS share access. To create CIFS share access, complete the following fields: a. Permission drop-down list—Choose the level of access permission from the list. b. User or Group field—Enter the user or group name for which the permissions are listed. c. Comment field—Enter comments, if any.
Delete Share Access	Deletes the CIFS share access.

Action	Description
Modify Share Access	Updates the permission to access the CIFS share.

Creating CIFS Shares

Procedure

- 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 that includes the NetApp C-Mode account and then click **View Details**.
- Step 5** Click **SVMs**.
- Step 6** Click the row of the SVM and then, from the **More Actions** drop-down list, choose **View Details**.
- Step 7** Click **CIFS Shares**.
- Step 8** Click **Create**.
- Step 9** On the **Create CIFS Share** screen, complete the following fields:

Name	Description
Volume Name drop-down list	Choose the volume under which you want to create the CIFS share.
Share Name field	Enter the name of the CIFS share.
Comment field	Enter comments, if any.
Set Share Access check box	Check the box to provide access to the CIFS share.

Managing DNS

You can view the domain, configured name servers, and see the state of DNS in the SVM account.

Procedure

- 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 that includes the NetApp C-Mode account and then click **View Details**.
- Step 5** Click **SVMs**.

Step 6 Click the row of the SVM and then, from the **More Actions** drop-down list, choose **View Details**.

Step 7 Click **DNS**.

Managing IP Hostname

You can view the IP address and hostname in the SVM account.

Procedure

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 that includes the NetApp C-Mode account and then click **View Details**.

Step 5 Click **SVMs**.

Step 6 Click the row of the SVM and then, from the **More Actions** drop-down list, choose **View Details**.

Step 7 Click **IP Hostname**.

Managing SIS Policy

You can define the Single Instance Storage (SIS) policy to perform SIS operations: compression and/or deduplication. Data compression can be used on-the-fly, and/or as a scheduled background operation. This can be followed by deduplication, which is a method of reducing disk space usage by eliminating duplicate data blocks on a FlexVol volume, where only a single instance of each unique data blocks is stored.

Procedure

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 that includes the NetApp C-Mode account and then click **View Details**.

Step 5 Click **SVMs**.

Step 6 Click the row of the SVM and then, from the **More Actions** drop-down list, choose **View Details**.

Step 7 Click **SIS Policies**.

When you choose a SIS policy, the following additional actions appear:

Action	Description
Create	Creates an SIS policy in the SVM account.
Delete	Deletes an SIS policy after confirmation.

Action	Description
Modify	Updates the SIS policy.

Creating a SIS Policy

Procedure

- 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 that includes the NetApp C-Mode account and then click **View Details**.
- Step 5** Click **SVMs**.
- Step 6** Click the row of the SVM and then, from the **More Actions** drop-down list, choose **View Details**.
- Step 7** Click **SIS Policies**.
- Step 8** Click **Create**.
- Step 9** On the **Create SIS Policy on SVM** screen, do the following:

Name	Description
SIS policy name field	Enter the name of the SIS policy.
Enabled drop-down list	Choose true to enable SIS policy on the SVM.
QOS Policy drop-down list	Choose best-effort or background as the QoS policy.
Duration field	Enter the duration in hours for which the scheduled SIS operation must run.
Schedule drop-down list	Choose the schedule of the SIS operation for the volume.
Comment field	Enter comments, if any.

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

Managing Export Rules

You can configure export rules to determine how to handle the client access requests to volumes.

At least one export rule needs to be added to an export policy to allow access to clients. If an export policy contains more than one rule, the rules are processed based on the rule index. The permissions defined in a rule are applied to the clients that match the client match criteria specified in the export rule.

Procedure

-
- 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 that includes the NetApp C-Mode account and then click **View Details**.
- Step 5** Click **SVMs**.
- Step 6** Click the row of the SVM and then, from the **More Actions** drop-down list, choose **View Details**.
- Step 7** Click **Export Rules**.

When you choose an export rule, the following additional actions appear:

Action	Description
Create	Creates an export rule.
Modify	Updates an export rule.
Delete	Deletes an export rule after confirmation.

Creating an Export Rule

Procedure

-
- 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 that includes the NetApp C-Mode account and then click **View Details**.
- Step 5** Click **SVMs**.
- Step 6** Click the row of the SVM and then, from the **More Actions** drop-down list, choose **View Details**.
- Step 7** Click **Export Rules**.
- Step 8** Click **Create**.
- Step 9** On the **Create Export Rule** screen, complete the following fields:

Action	Description
Policy Name drop-down list	Choose an export policy to which you want to add the new export rule. The export policy must already exist. For more information, see Managing Export Policies, on page 105 .

Action	Description
Access Protocol drop-down list	Choose an access protocol to which you want to apply the export rule. The possible values of the access protocol include the following: • Any—Any current or future access protocol • NFS—Any current or future version of NFS • NFS3—The NFSv3 protocol • NFS4—The NFSv4 protocol • CIFS—The CIFS protocol • FlexCache—The FlexCache protocol
Client Match Spec field	Enter the client or clients to which the export rule applies. You can specify the match in any of the following formats: • As a hostname; for instance, host1 • As an IPv4 address; for instance, 10.1.12.24 • As an IPv4 address with a subnet mask expressed as a number of bits; for instance, 10.1.12.10/4 • As an IPv4 address with a network mask; for instance, 10.1.16.0/255.255.255.0 • As a netgroup, with the netgroup name preceded by the @ character; for instance, @eng • As a domain name preceded by the . character; for instance, .example.com

Action	Description
Read Only Access Rule drop-down list	Choose one of the following options to define the security type for read-only access to volumes: • Any—To allow read access to the volume regardless of the security type of the incoming request. The effective security type of the incoming request remains the same. • Note If the security type of the incoming request is AUTH_NONE, read access will be granted to the incoming request as an anonymous user. • None—To allow read access to the volume as an anonymous user if the security type of the incoming request is not explicitly listed in the list of values in the read-only rule. The effective security type of the incoming request becomes none. • Never—To not allow any access to the volume regardless of the security type of the incoming request. • KRB5—To allow read access to the volume if the security type of the incoming request is Kerberos 5. The effective security type of the incoming request becomes KRB5. • NTLM—To allow read access to the volume if the security type of the incoming request is CIFS NTLM. The effective security type of the incoming request becomes NTLM. • Sys—To allow read access to the volume if the security type of the incoming request is AUTH_SYS. The effective security type of the incoming request becomes Sys.

Action	Description
Read Write Access Rule drop-down list	Choose one of the following options to define the security type for read-write access to volumes: • Any—To allow write access to the volume regardless of the effective security type of the incoming request. • None—To allow write access to the volume as an anonymous user if the effective security type of the incoming request is none. Note If the effective security type of the incoming request is none, write access will be granted to the incoming request as an anonymous user. • Never—To not allow write access to the volume regardless of the effective security type of the incoming request. • KRB5—To allow write access to the volume if the effective security type of the incoming request is Kerberos 5. • NTLM—To allow write access to the volume if the effective security type of the incoming request is CIFS NTLM. • Sys—To allow write access to the volume if the effective security type of the incoming request is AUTH_SYS.
Rule Index field	Enter the index number of the export rule that specifies the order of the rule in the export policy.

Step 10 Click **Submit**.

Managing Export Policies

An export policy includes export rules to control client access to volumes. An export policy must exist on SVM for clients to access data. You associate an export policy with each volume to configure client access to the volume.

A single SVM can contain multiple export policies. This enables you to do the following for SVMs with multiple volumes:

- Assign different export policies to each volume of a single SVM for individual client access control to each volume in the SVM.
- Assign the same export policy to multiple volumes of a single SVM for identical client access control without having to create a new export policy for each volume.

Procedure

-
- 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 that includes the NetApp C-Mode account and then click **View Details**.
- Step 5** Click **SVMs**.
- Step 6** Click the row of the SVM and then, from the **More Actions** drop-down list, choose **View Details**.
- Step 7** Click **Export Policies**.

When you choose an export policy, the following additional actions appear:

Action	Description
Create	Creates an export rule.
Delete	Deletes an export rule after confirmation.
Modify	Updates an export rule.

Managing Snapshot Policies

Procedure

-
- 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 that includes the NetApp C-Mode account and then click **View Details**.
- Step 5** Click **SVMs**.
- Step 6** Click the row of the SVM and then, from the **More Actions** drop-down list, choose **View Details**.
- Step 7** Click **Snapshot Policies**.

When you choose a snapshot policy, the following additional actions appear:

Action	Description
Create	Creates a new snapshot policy.
Enable/Disable	Enables or disables the snapshot policy.
Delete	Deletes the snapshot policy.

Action	Description
View Details	Displays the schedule of the snapshot policy. Also, provides the options to create a new schedule, update a schedule, and delete the schedule.

Creating a Snapshot Policy

Procedure

- 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 that includes the NetApp C-Mode account and then click **View Details**.
- Step 5** Click SVMs.
- Step 6** Click the row of the SVM and then, from the **More Actions** drop-down list, choose **View Details**.
- Step 7** Click **Snapshot Policies**.
- Step 8** Click **Create**.
- Step 9** On the **Create Snapshot Policy** screen, complete the following fields:

Action	Description
Snapshot Policy Name field	Enter the name of the snapshot policy.
Schedule drop-down list	Choose the cron job or schedule interval to be added to the policy.
Count field	Enter the number of snapshots to be retained for the schedule.
Snapmirror Label field	Enter the label of the SnapMirror.
Prefix field	Enter the prefix text to be included in the created snapshot names.
Is Enabled check box	Check this box to enable the policy.

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

Managing Port Sets

A port set consists of a group of Fibre Channel (FC) target ports. You bind a port set to an igroup to make the LUN available only on a subset of the storage system's target ports. Any host in the igroup can access the LUNs only by connecting to the target ports in the port set.

If an igroup is not bound to a port set, the LUNs mapped to the igroup are available on all of the storage system FC target ports. The igroup controls to which initiators LUNs are exported. The port set limits the target ports on which those initiators have access.

Procedure

- 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 that includes the NetApp C-Mode account and then click **View Details**.
- Step 5** Click **SVMs**.
- Step 6** Click the row of the SVM and then, from the **More Actions** drop-down list, choose **View Details**.
- Step 7** Click **Portsets**.

When you choose a port set, the following additional actions appear:

Action	Description
Create	Creates a port set. On the Create Portset screen, do the following: a. In the Portset Name field, enter the port set name. b. In the Portset Type drop-down list, choose ISCSI, FCP, or MIXED as the port set type. c. Click Submit.
Destroy	Deletes a port set after confirmation.
Add Port	Adds a port to a port set. On the Add Port To Portset screen, expand LIF Identity and choose the LIF that needs to be added to the port set.
Remove Port	Removes a port from a port set. On the Remove Port From Portset screen, choose a port that needs to be removed from the port set.

Managing WWPN Aliases

A World Wide Port Names (WWPN) is a unique, 64-bit identifier displayed as a 16-character hexadecimal value in Data ONTAP. However, SAN Administrators may find it easier to identify FC ports using an alias instead, especially in larger SANs. You can create multiple aliases for a WWPN, but you cannot use the same alias for multiple WWPNs.

Procedure

- 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 that includes the NetApp C-Mode account and then click **View Details**.
- Step 5** Click **SVMs**.
- Step 6** Click the row of the SVM and then, from the **More Actions** drop-down list, choose **View Details**.
- Step 7** Click **WWPN Aliases**.

When you choose a port set, the following additional actions appear:

Action	Description
Create	Creates a WWPN Alias. On the Create WWPN Alias screen, do the following: - In the WWPN Alias field, enter the WWPN alias name. The alias can consist of up to 32 characters and can contain only the letters A through Z, a through z, numbers 0 through 9, hyphen (-), underscore (_), left brace ({), right brace (}), and period (.). - In the WWPN field, enter the FCP initiator WWPN name. For example, 00:00:00:00:00:00:00:00. - Click Submit.
Modify	Updates the WWPN of the alias.
Delete	Deletes the WWPN alias after confirmation.

Managing FCP Services

Fibre Channel (FC) is a licensed service on the storage system that enables you to export logical units (LUNs) and transfer block data to hosts using the Small Computer System Interface (SCSI) protocol over a Fibre Channel fabric.

Procedure

- 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 that includes the NetApp C-Mode account and then click **View Details**.

Step 5 Click **FCP Services**.

When you choose a FCP service, the following additional actions appear:

Action	Description
Create	Creates an FCP service on SVM.
Destroy	Deletes the FCP service after confirmation.
Start FCP Service	Starts the FCP service on SVM.
Stop FCP Service	Stops the FCP service that is running on SVM.

Creating a FCP Service

Procedure

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 that includes the NetApp C-Mode account and then click **View Details**.

Step 5 Click **FCP Services**.

Step 6 Click **Create**.

Step 7 On the **Create FCP Service** screen, complete the following fields:

Name	Description
SVM list	Expand the list, choose the SVM on which you want to create the FCP service, and click Select .
FCP Target Node Name field	Enter the worldwide node name (WWNN) that is used to identify the FC node.
Start check box	Check this box to start the FCP service on the SVM.

Step 8 Click **Submit**.

Creating and Managing SVM Peers

Procedure

- 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 that includes the NetApp C-Mode account and then click **View Details**.
- Step 5** Click **SVM Peer**.

When you choose an existing SVM peer relationship, the following additional actions appear:

Action	Description
Create	Creates a new SVM peer relationship. To create a new SVM peer relationship, complete the following fields: • Select Local SVM Name list—Expand the list and choose the SVM that you want to use as the local SVM. • Select Peer SVM Name list—Expand the list and choose the SVM that you want to use as the peer SVM.
Delete	Deletes the SVM peer relationship.
Accept	Accepts the SVM peer relationship.
Reject	Rejects the SVM peer relationship.

Creating a Cluster Peer

Procedure

- 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 that includes the NetApp C-Mode account and then click **View Details**.
- Step 5** Click **Cluster Peer**.
- Step 6** Click **Create**.

Step 7 On the **Create Cluster Peer Relationship** screen, complete the following fields:

Name	Description
Select Peer Cluster list	Expand the list and choose the cluster account that you want to use.
Time Out Seconds field	Enter the time out value in seconds.

Step 8 Click **Submit**.

Managing SnapMirror and SnapVault Relationships

SnapMirror software is a disaster recovery and data distribution solution, whereas SnapVault is a backup solution that is exclusively used to archive data. SnapMirror mirrors data to one or more network filers at high speed over LAN or WAN connections. If a disaster occurs, the destination volume can be made as source (reverse SnapMirror). SnapVault is a collection of snapshot copies of the primary volume, which can be restored with minimal downtime when there is data loss or when a system is corrupted.

Both the SnapMirror and SnapVault relationships can be managed through **SnapMirrors**. **SnapMirrors** displays both the SnapMirror and SnapVault data, with the **Relationship Type** column differentiating the data.

Procedure

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 that includes the NetApp C-Mode account and then click **View Details**.

Step 5 Click **SnapMirrors**.

When you choose a SnapMirror or SnapVault, the following additional actions appear:

Action	Description
Create	Creates a new SnapMirror or SnapVault relationship.
Delete	Deletes a SnapMirror or SnapVault relationship.
Modify	Updates an existing SnapMirror or SnapVault relationship.
Initialize	Starts an initial transfer over the network for a specific destination. Sets the transfer priority to Low or Normal .
Update	Performs an incremental transfer.
Resync	Kicks off a resynchronization of a broken SnapMirror or SnapVault pair.

Action	Description
Break	Breaks the SnapMirror relationship. You cannot check whether the operation is legal or whether it is successful. The result is updated after the inventory collected in this task. Note The break action is not applicable for a SnapVault relationship.
Quiesce	Pauses a SnapMirror or SnapVault transfer to the destination.
Promote	Promotes SnapMirror after a confirmation. Note The Promote action is not applicable for a SnapVault relationship.
Release	Releases SnapMirror or SnapVault to permanently end a relationship.
Resume	Enables future transfers for a SnapMirror or SnapVault relationship that has been quiesced.
Abort	Aborts a SnapMirror or SnapVault transfer before it is complete.
Inventory	Runs a SnapMirror or SnapVault inventory.

Creating a SnapMirror Relationship

Before you begin

You must create a SVM peer to create an intra-cluster SnapMirror relationship. If you want to establish an inter-cluster SnapMirror relationship, you must create a cluster peer and a server peer.

Procedure

- 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 that includes the NetApp C-Mode account and then click **View Details**.
- Step 5** Click **SnapMirrors**.
- Step 6** Click **Create**.
- Step 7** On the **Create SnapMirror Relationship** screen, complete the following fields:

Name	Description
Relationship Type drop-down list	Choose one of the following options as the type of relationship: • Data Protection • Load Sharing • SnapVault
Destination Volume list	Expand the list to choose the destination volumes and then click Select .
Source Volume list	Expand the list to choose the source volumes.
Policy list	Expand the list to choose the SnapMirror policies.
Schedule list	Expand the list to choose the cron job to schedule the SnapMirror update.
Maximum Transfer Rate Kbps field	Enter the maximum transfer rate. The default value is zero, which means that the MTR is unlimited.

Step 8 Click **Submit**.

Managing SnapMirror Policies

Procedure

- 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 that includes the NetApp C-Mode account and then click **View Details**.
- Step 5** Click **SnapMirrors Policies**.
- When you choose a SnapMirror policy, the following additional actions appear:

Action	Description
Create	Creates a new SnapMirror policy.
Delete	Deletes the SnapMirror policy after confirmation.
Modify	Updates the restart type and transfer rate of the SnapMirror policy.

Action	Description
Add Rule	Adds rule to the SnapMirror policy. To add a rule to the SnapMirror policy, complete the following fields: • Snapshot Copy Retention Count field—Enter the snapshot copy retention count. • SnapMirror Label field—Enter the snapshot copy label. • Preserve check box—Check this box to enable a snapshot copy reservation. • Warning Threshold Count field—Enter the warning threshold count.
Remove Rule	Removes the selected rule from the SnapMirror policy.
Modify Rule	Updates the rule in the SnapMirror policy.
View Details	Displays the SnapMirror policy rules.

Creating a SnapMirror Policy

Procedure

- 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 that includes the NetApp C-Mode account and then click **View Details**.
- Step 5** Click **SnapMirrors Policies**.
- Step 6** Click **Create**.
- Step 7** On the **Create SnapMirror Policy** screen, complete the following fields:

Name	Description
SVM Name list	Extend the list and choose the SVM name.
Enter Policy Name field	Enter the name of the policy.

Name	Description
Restart drop-down list	Choose one of the following options as the type of restart: • always • never • default
Transfer Priority drop-down list	Choose one of the following options as the transfer priority: • None • normal • low
Enter Comment field	Enter comments, if any.

Step 8 Click **Submit**.

Managing Snapshot Policies

Procedure

- 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 that includes the NetApp C-Mode account and then click **View Details**.
- Step 5** Click **Snapshot Policies**.

When you choose a snapshot policy, the following additional actions appear:

Action	Description
Create	Creates a new snapshot policy.
Enable/Disable	Enables or disables the snapshot policy.
Delete	Deletes the snapshot policy.
View Details	Displays the schedule of the snapshot policy. Also, provides the options to create a new schedule, update a schedule, and delete the schedule.

Creating a Snapshot Policy

Procedure

- 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 that includes the NetApp C-Mode account and then click **View Details**.
- Step 5** Click **Snapshot Policies**.
- Step 6** Click **Create**.
- Step 7** On the **Create Snapshot Policy** screen, complete the following fields:

Action	Description
Snapshot Policy Name field	Enter the name of the snapshot policy.
Schedule drop-down list	Choose the cron job or schedule interval to be added to the policy.
Count field	Enter the number of snapshots to be retained for the schedule.
Snapmirror label field	Enter the label of the SnapMirror.
Prefix field	Enter the prefix text to be included in the created snapshot names.
Is Enabled check box	Check this box to enable the snapshot policy.

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

Managing Jobs

Procedure

- 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 that includes the NetApp C-Mode account and then click **View Details**.
- Step 5** Click **Jobs**.
- The following action appears:

Action	Description
Inventory	Runs a job inventory after confirmation.

Managing Cron Job Schedules

Procedure

- 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 that includes the NetApp C-Mode account and then click **View Details**.
- Step 5** Click **Cron Job Schedules**.

The following action appears:

Action	Description
Create	Creates a cron job schedule.

When you choose a cron job schedule, the **Modify** and **Delete** actions appear.

Creating a Cron Job Schedule

Procedure

- 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 that includes the NetApp C-Mode account and then click **View Details**.
- Step 5** Click **Cron Job Schedules**.
- Step 6** Click **Create**.
- Step 7** On the **Create Cron Job Schedule** screen, complete the following fields:

Name	Description
Job Schedule Name field	Enter the name of the cron job schedule.
Day of Month field	Enter the values for the cron day of month separated by commas.

Name	Description
Day of Week field	Enter the values for the cron day of week separated by commas.
Hour field	Enter the values for the cron hour separated by commas.
Minute field	Enter the values for the cron minutes separated by commas.
Month field	Enter the values for the cron month separated by commas.

Step 8 Click **Submit**.

Managing NFS Services

Procedure

- 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 that includes the NetApp C-Mode account and then click **View Details**.
- Step 5** Click **NFS Services**.

When you choose a NFS service, the following additional actions appear:

Action	Description
Create	Creates the NFS service.
Modify	Updates the NFS service.
Destroy	Deletes the NFS service.
Starts NFS Service	Starts the NFS service.
Stops NFS Service	Stops the NFS service.

Creating an NFS Service

Procedure

- 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 that includes the NetApp C-Mode account and then click **View Details**.
- Step 5** Click **NFS Services**.
- Step 6** Click **Create**.
- Step 7** On the **Create NFS Service** screen, complete the following fields:

Name	Description
SVM Name list	Expand the list to choose the SVM names and then click Select .
Is NFS Access Enabled check box	Check this box to enable the NFS access.
Is Vstorage Enabled check box	Check this box to enable the vStorage for the NFS service.

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

Managing System Tasks

A multi-node setup improves scalability by offloading the processing of system tasks, such as inventory data collection, from the primary node to one or more service nodes. You can assign certain system tasks to one or more service nodes. The number of nodes determines how the processing of system tasks are scaled.

Procedure

- 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 that includes the NetApp C-Mode account and then click **View Details**.
- Step 5** Click **System Tasks**.

The tasks that are defined for the account is displayed. For more information about how to manage system tasks, see the [Cisco UCS Director Administration Guide](#).

Managing Routing Group Routes

Procedure

- 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 that includes the NetApp C-Mode account and then click **View Details**.
- Step 5** Click **Routing Group Routes**.
- When you choose a route group, the following additional actions appear:

Action	Description
Create	Creates a routing group route. To create a routing group, complete the following fields: • SVM Name list—Choose the SVM. • Routing Group field—Enter the name for the routing group. For example, d192.168.1.0/24 (where d, c, and n stands for data, cluster, node LIF and 192.168.1.0/24 is the subnet). • Gateway Address field—Enter the IP address of the gateway. For example, 192.168.1.1. • Destination Address field—Enter the IP address and subnet mask of the destination. For example, 192.168.1.0/24. • Metric field—Enter the metric (hop count) of the LIF.
Delete	Deletes a routing group route.

Managing C-Mode Licenses

Procedure

- 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 that includes the NetApp C-Mode account and then click **View Details**.
- Step 5** Click **Licenses**.
- The following action appears:

Action	Description
Add	Adds a NetApp C-Mode license to a cluster.

When you choose a license, the **Delete** action appear.

Adding a C-Mode License to a Cluster

Procedure

-
- 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 that includes the NetApp C-Mode account and then click **View Details**.
 - Step 5** Click **Licenses**.
 - Step 6** Click **Add**.
 - Step 7** On the **Add License to Cluster** screen, enter a license code in the **License Code** field.
 - Step 8** Click **Submit**.
-

Selecting an API for NetApp Management

The Cisco UCS Director allows you to select one of the following APIs for management of NetApp.

- ZAPI
- REST

To select the preferred API for NetApp, perform the following:

Procedure

-
- Step 1** Choose **Orchestration > REST API Browser**.
The Workflow tasks are displayed.
 - Step 2** Select **NetApp clustered Data ONTAP Tasks** from the list.
Note To quickly select the **NetApp clustered Data ONTAP Tasks**, enter **netAppSystemProperty** in the **Search** field.
 - Step 3** Double-click the **netAppSystemProperty CREATE** task.
 - Step 4** In the **API Examples** tab, perform the following:

Name	Description
API Type drop-down list	Select one of the following APIs: • ZAPI • REST REST API is selected by default.
Generate XML button	Click this button to generate the API request. The API request is generated in an XML format, which is displayed in the Sample XML field.
Execute REST API button	Click this button to execute the API. The API response is generated in an XML format, which is displayed in the Response field.
Close button	Click this button to complete the process.

Note If unexpected NetApp functionalities happen, change the API.
