Cisco UCS Director NetApp Management Guide, Release 5.5

First Published: June 14, 2016

Americas Headquarters
Cisco Systems, Inc.
170 West Tasman Drive
San Jose, CA 95134-1706
USA
http://www.cisco.com
Tel: 408 526-4000
800 553-NETS (6387)
Fax: 408 527-0883

CONTENTS

Preface

Audience

This guide is intended primarily for data center administrators who use Cisco UCS Director 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 *this font*.
TUI elements	In a Text-based User Interface, text the system displays appears in `this font`.

Text Type	Indication
System output	Terminal sessions and information that the system displays appear in `this font`.
CLI commands	CLI command keywords appear in **this font**. Variables in a CLI command appear in *this font*.
[ ]	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.

Obtaining Documentation and Submitting a Service Request

For information on obtaining documentation, using the Cisco Bug Search Tool (BST), submitting a service request, and gathering additional information, see What's New in Cisco Product Documentation.

To receive new and revised Cisco technical content directly to your desktop, you can subscribe to the What's New in Cisco Product Documentation RSS feed. RSS feeds are a free service.

CHAPTER 1

New and Changed Information for this Release

This chapter contains the following section:

New and Changed Information for this Release

The following table provides an overview of the significant changes to this guide for the 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.

Feature	Description	Where Documented
Support for managing SnapVault relationships	You can now manage SnapVault relationships in the clustered mode and 7-mode ONTAP accounts	C-Mode: Managing SnapMirror and SnapVault Relationships, on page 115 ONTAP: Managing SnapVault Relationships, on page 68

New and Changed Information for this Release

CHAPTER 2

Overview

This chapter contains the following section:

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.

CHAPTER 3

Managing NetApp Accounts

This chapter contains the following sections:

About Managing the NetApp Storage System

Cisco UCS Director supports the NetApp storage infrastructure. Cisco UCS Director provides auto-discovery, monitoring, and complete visibility that enables you to manage all NetApp filer components.

Cisco UCS Director enables you to monitor and manage various components of the NetApp storage system. To manage the NetApp storage system, you need to add a pod and create a NetApp account.

NetApp has two types of accounts:

- 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 a time interval that you configured in the **System Tasks** tab. To access the **System Tasks** tab, choose **Administration** > **System**.
- Data ONTAP is an operating system used by the NetApp filer. Data ONTAP has two modes:
  - Cluster mode—Defines an architecture that is made 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 allow

data operations to be moved in a nondisruptive way. Cluster administrators can administer the entire cluster and the SVMs within the cluster.

- SVM — SVM (formerly known as Vserver) is a secure virtual storage server that supports multiple protocols and unified storage. Each SVM is configured for the 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.

  SVM administrator can administer SVMs and its resources such as volumes, protocols, and services, depending on the capabilities assigned by the cluster administrator.

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.

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

Step 2 Click the **Pods** tab.

Step 3 Click **Add**.

Step 4 In the **Add Pod** dialog box, complete the following fields:

Name	Description
Name field	A descriptive name for the pod.
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.
Type drop-down list	Choose the type of pod that you want to add. This can be one of the following supported types: • **Flexpod** • **Generic** • **ExpressPod Medium** • **VSPEX** • **ExpressPod Small** • **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 nongeneric pod types accommodate only specific physical and virtual components. For more information about pod licenses, see Cisco UCS Director Install and Upgrade Guides.

Name	Description
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 check box to hide the pod if you do not want it to show 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

- Starting with Release 5.4, 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.
- Add the pod to which this NetApp account belongs.
- Manually configure an aggregate on the ONTAP filer before you can use the filer management of Cisco UCS Director.

Step 1 From the **Administration** menu, choose **Physical Accounts**.

Step 2 Click the **Physical Accounts** tab.

Step 3 On the **Physical Accounts** page, click **Add**.

Step 4 In the **Add Account** dialog box, complete the following fields:

Name	Description
Pod drop-down list	Choose the pod to which this account belongs. Allowed pod types are **Default**, **Generic**, and **Flexpod**.

Name	Description
Category Type drop-down list	Choose the category type. You must 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**
Account Name field	A unique name that you assign to this account.
Server Address field	The IP address of the NetApp server. For a cluster configuration, this is the virtual IP address. For SVM account, this is the IP address of the SVM.
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.
Password field	The password associated with the username.
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.
Description field	(Optional) A description of this account.
Contact Email field	The email address that you can use to contact the administrator or other person responsible for this account.
Location field	The location of this account.
Service Provider field	(Optional) The name of the service provider associated with this account, if any.

Step 5 Click **Add**.

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

The polling interval configured on the **System Tasks** tab on the **Administration** > **System** window 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.

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

Step 2 Click the **Physical Accounts** tab.

Step 3 In the table, click the account for which you want to test the connection.

Step 4 Click **Test Connection**.

Step 5 When the connection test has completed, 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.

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

Step 2 In the left pane, 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 a Sites node is expanded, 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 list, all multi-domain manager account types that you added to Cisco UCS Director are displayed.

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

Step 4 In the table, click the account that you want to verify.

Step 5 Click **View Details**.

Cisco UCS Director displays the components of 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**.

Step 6 Click **Back** to return to the **Storage Accounts** tab.

Requirements for Adding SVMs to 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

Step 1 From the **Administration** menu, choose **Physical Accounts**.

Step 2 Click the **Physical Accounts** tab.

Step 3 On the **Physical Accounts** page, click **Add**.

Step 4 In the **Add Account** dialog box, complete the following fields:

Name	Description
Pod drop-down list	Choose **Default**.
Category Type drop-down list	Choose **Storage**.
Account Type drop-down list	Choose the **NetApp ONTAP** account.
Account Name field	Enter the unique name that you want to assign to this account.
Server Address field	Enter the IP address of the SVM.
User ID field	Enter the username that this account will use to access the NetApp server.
Password field	Enter the password associated with the username.

Name	Description
Transport Type drop-down list	Choose one of the following transport types that you want to use for this account: • **http** • **https**
Port field	Enter the port used to access the NetApp account.
Description field	(Optional) A description of this account.
Contact Email field	(Optional) The email address that you can use to contact the person responsible for this account.
Location field	(Optional) The location of this account.
Service Provider field	(Optional) The name of the service provider associated with this account, if any.

Step 5 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

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 the **Disks** tab, all the disks that are available in that account are displayed. Choose a disk and 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.

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

Step 2 In the left pane, choose the pod that includes the NetApp OnCommand account.

Step 3 Click the **Storage Accounts** tab.
The accounts that have been added to the pod are displayed.

Step 4 Click the NetApp OnCommand account and click **View Details**.
The following tabs appear:

Action	Description
Filers	Displays the filers that are available in the account.
Assessment	Displays the filer readiness report.
System Tasks	Displays the tasks that are defined for the account. For more information about how to manage system tasks, see the Cisco UCS Director Administration Guide.

Step 5 Click the **Filers** tab.
Alternately, you can expand pods and choose the NetApp OnCommand account to view the list of filers in the account.

When you choose a filer, you will get the following actions:

Action	Description
View Details	Displays information about the current status of the selected component. You can click the tabs in the window for more details about that 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 the remote system for host address resolution.

Step 6 Click the filer and click **View Details**.
The **Storage Filer** window displays information about the selected filer. Click the tabs in the window to view more details about the filer component.

Managing Virtual Machines

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

Step 2 In the left pane, choose the pod that includes the NetApp Oncommand account and select the NetApp Oncommand account.

Step 3 Click the filer and click **View Details**.

Step 4 Click the **VMs** tab.
The VMs available in the filer are displayed. The **VMs** tab provides the following actions:

Action	Description
Refresh	Refreshes the current page.
Favorite	Adds this page to the **Favorites** tab which displays the page that you go to most often.

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—*Display Only*. 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: 1 **VM Name** field—*Display Only*. The name of the VM. 2 **Current Allocated CPU** field—*Display Only*. The current size of CPU allocated to the VM. 3 **Current Allocated Memory (GB)** field—*Display Only*. The current allocated memory of the VM. 4 **New CPU Count** drop-down list—Choose the new CPU size of the VM. 5 **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: 1 **VM Name** field—*Display Only*. The name of the VM. 2 **Task** field—*Display Only*. The task to be applied for the VM. 3 **Comments** field—Comments, if any. 4 **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: 1 **VM Name** field—*Display Only*. The name of the VM. 2 **Task** field—*Display Only*. The task to be applied for the VM. 3 **Comments** field—Comments, if any. 4 **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.

Step 1 Navigate to the **Storage Filer** window.
For information about how to navigate to the Storage Filer window, see Managing Filers, on page 14.

Step 2 Click the **Interfaces** tab.
Cisco UCS Director displays a list of VLAN interfaces available in the filer.

Step 3 Click **Create VLAN**.

Step 4 In the **Create vLAN** dialog box, 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 5 Click **Create**.

Step 6 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.

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

Step 2 In the left pane, choose the pod that includes the NetApp OnCommand account to view the list of Filers in the account.

Step 3 Click the filer and click **View Details**.
Cisco UCS Director displays information about the selected filer. Click the tabs in the window for more details about the filer component.

Step 4 Click the **IP Spaces** tab.
Cisco UCS Director displays a list of IP spaces available in the filer. The **IP Spaces** tab provides the following actions:

Action	Description
Refresh	Refreshes the current page.

Action	Description
Favorite	Adds this page to the **Favorites** tab which displays the page that you go to most often.
Create	Creates an IP space in the filer.

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

Action	Description
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.

Step 1 Navigate to the **Storage Filer** window.
For more information about how to navigate to the **Storage Filer** window, see Managing IP Spaces, on page 19.

Step 2 Click the **IP Spaces** tab.
Cisco UCS Director displays a list of IP spaces available in the filer.

Step 3 Click **Create**.
The **Create IP Space** dialog box appears.

Step 4 In the **IP Space Name** field, enter the IP space name.

Step 5 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.

Step 1 Navigate to the **Storage Filer** window.
For more information about how to navigate to the **Storage Filer** window, see Managing Filers, on page 14.

Step 2 Click the **IP Spaces** tab.
Cisco UCS Director displays a list of IP spaces available in the filer.

Step 3 Click the row of an IP Space to which you want to assign a VLAN interface.

Step 4 Click **Assign**.
The **Assign IP Space to a vLAN** dialog box appears.

Step 5 From the **Select VLAN Interface** drop-down list, choose the VLAN interface.

Step 6 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.

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

Step 2 In the left pane, choose the pod that includes the NetApp Oncommand account to view the list of Filers in the account.

Step 3 Click the row of a filer and click **View Details**.
Cisco UCS Director displays information about the selected filer. Click the tabs in the window for more details about the filer component.

Step 4 Click the **vFilers** tab.
The vFilers available under the account are displayed. The **vFiler** tab provides the following actions:

Action	Description
Refresh	Refreshes the current page.
Favorite	Adds this page to the **Favorites** tab which displays the page that you go to most often.
Create	Creates a vFiler in the NetApp OnCommand account.

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

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 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.

Action	Description
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.
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 o a VLAN.

Step 1 Navigate to the **vFiler** tab.
For more information about how to navigate to the **vFiler** tab, see Managing vFilers, on page 21.

Step 2 Click **Create**.

Step 3 In the **Create vFiler** dialog box, 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 (ipspaces) on a vfiler.
vFiler Name field	A unique name that you assign to this vFiler.

Name	Description
IP Address field	The IP address of the vFiler.
Select Storage Unit field	Choose a storage unit.

Step 4 Click **Create**.

Setting up a vFiler

Step 1 Navigate to the **vFiler** tab.
For more information about how to navigate to the **vFiler** tab, see Managing vFilers, on page 21.

Step 2 Click the vfiler and click **Setup**.

Step 3 In the **Setup vFiler** dialog box, complete the following fields:

Name	Description
vFiler Name field	*Display Only*. Displays the name of the vFiler.
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 4 Click **Submit**.

Setting up a CIFS Server for a vFiler

Step 1 Navigate to the **vFiler** tab.
For more information about how to navigate to the **vFiler** tab, see Managing vFilers, on page 21.

Step 2 Click the vfiler and click **Setup CIFS**.

Step 3 In the **Setup CIFS** dialog box, complete the following fields:

Name	Description
vFiler Name field	*Display Only*. Displays the name of the vFiler.
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 4 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

Step 1 Navigate to the **vFiler** tab.
For more information about how to navigate to the **vFiler** tab, see Managing vFilers, on page 21.

Step 2 Click the vFiler to which you want to assign a group and click **Assign Group**.

Step 3 In the **Select Group** dialog box, complete the following fields:

Name	Description
Assign to Users check box	Check this check 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 4 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.

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

Step 2 In the left pane, choose the pod that includes the NetApp OnCommand account to view the list of Filers in the account.

Step 3 Click the filer and click **View Details**.
Cisco UCS Director displays information about the selected filer. Click the tabs in the window for more details about the filer component.

Step 4 Click the **Aggregates** tab.
The Aggregates available under the account are displayed. The **Aggregate** tab provides the following actions:

Action	Description
Refresh	Refreshes the current page.

Action	Description
Favorite	Adds this page to the **Favorites** tab which displays the page that you go to most often.
Create	Creates an aggregate in the NetApp OnCommand account.

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

Action	Description
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 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.

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

Step 2 In the left pane, choose the pod that includes the NetApp OnCommand account to view the list of Filers in the account.

Step 3 Click the filer and click **View Details**.
Cisco UCS Director displays information about the selected filer. Click the tabs in the window for more details about the filer component.

Step 4 Click the **Initiator Groups** tab.
Cisco UCS Director displays the initiator groups available in the account. The **Initiator Groups** tab provides the following actions:

Action	Description
Refresh	Refreshes the current page.
Favorite	Adds this page to the **Favorites** tab which displays the page that you go to most often.
Create	Creates an initiator group to the NetApp OnCommand account.

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.
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

Step 1 Navigate to the **Initiator Groups** tab.
For more information about how to navigate to the **Initiator Groups** tab, see Managing Initiator Groups, on page 28.

Step 2 Click **Add**.

Step 3 In the **Create Initiator Group** dialog box, 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 4 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.

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

Step 2 In the left pane, choose the pod that includes the NetApp OnCommand account to view the list of Filers in the account.

Step 3 Click the filer and click **View Details**.
Cisco UCS Director displays information about the selected filer. Click the tabs in the window for more details about the filer component.

Step 4 Click the **Initiators** tab.
The initiators available under the account are displayed. The **Initiators** tab provides the following actions:

Action	Description
Refresh	Refreshes the current page.

Action	Description
Favorite	Adds this page to the **Favorites** tab which displays the page that you go to most often.
Add	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.

Adding an Initiator

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

Step 1 Navigate to the **Initiators** tab.
For more information about how to navigate to the **Initiators** tab, see Managing Initiators, on page 29.

Step 2 Click **Create**.

Step 3 In the **Create Initiator** dialog box, 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	A unique name that you assign to this initiator.
Force check box	Check this check box to forcibly add the initiator.

Step 4 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).

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

Step 2 In the left pane, choose the pod that includes the NetApp Oncommand account and select the NetApp Oncommand account.

Step 3 Click the filer and click **View Details**.

Step 4 Click the **LUNs** tab.
The LUNs available in the volume are displayed. The **LUNs** tab provides the following actions:

Action	Description
Refresh	Refreshes the current page.
Favorite	Adds this page to the **Favorites** tab which displays the page that you go to most often.
Create	Creates an LUN in the NetApp Oncommand account.

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

Action	Description
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.
Unmap iGroup	Unmaps the iGroup from the selected LUN after confirmation.

Action	Description
Resize	Resizes the LUN. To resize the LUN, complete the following fields: 1 **LUN Name** field—*Display Only*. The name of the LUN. 2 **Current LUN Size** field—*Display Only*. The current size of the LUN. 3 **New Size** field—The required size of the LUN. 4 **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

Step 1 Navigate to the **LUNs** tab.
For more information about how to navigate to the **LUNs** tab, see Managing LUNs, on page 31.

Step 2 Click **Create**.

Step 3 In the **Create LUN** dialog box, 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.
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.

Name	Description
Space Reserve check box	By default, the LUN has a reserved space. Check this check box to manage the space usage manually and to create a LUN without any space being reserved.

Step 4 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.

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

Step 2 In the left pane, choose the pod that includes the NetApp Oncommand account to view the list of Filers in the account.

Step 3 Click the row of a filer and click **View Details**.
Cisco UCS Director displays information about the selected filer. Click the tabs in the window for more details about the filer component.

Step 4 Click the **Volumes** tab.
The volumes available under the account are displayed. The **Volumes** tab provides the following actions:

Action	Description
Refresh	Refreshes the current page.
Favorite	Adds this page to the **Favorites** tab which displays the page that you go to most often.
Create	Creates a volume in the NetApp OnCommand account.

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

Action	Description
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
Delete	Deletes the volume.
Resize	Resizes an existing volume. To resize the volume, complete the following fields: 1 **Volume Name** field—*Display Only*. The name of the volume. 2 **Current Volume Size**—*Display Only*. The current size of the volume in GB. 3 **New Size** field—The required size of the volume. 4 **Size Units** drop-down list—Choose the size of the volume as **MB**, **GB**, or **TB**. 5 **File System Size Fixed** check box—Check this check 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.

Action	Description
NFS Export	Exports the volume as a file through NFS. To export the volume, complete the following fields: 1 **Actual Path** field—*Display Only*. The actual path of the selected volume. 2 **Export Path** field—The path where the volume should be mounted in the UNIX environment 3 **Read-Write Hosts** field—The comma-separated list of hosts that have read-write access to the volume. 4 **Root Hosts** field—The comma-separated list of hosts that have root access to the volume. 5 **Security** drop-down list—Choose the security applicable for this export. 6 **Persists NFS Export Rule** check box—Check this check 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: 1 **Volume Name** field—*Display Only*. The name of the selected volume. 2 **Snapshot Name** field—The name of the snapshot. 3 **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. 4 **Async** check box—Check this check box to create the snapshot asynchronously.
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. 1 **Current Snapshot Reserved (%)**—*Display Only*. The current percentage of volume space reserved for snapshots. 2 **New Percentage (%)**—The percentage of volume space to be reserved for snapshots.

Creating a Volume

Step 1 Navigate to the **Volumes** tab.
For more information about how to navigate to the **Volumes** tab, see the "Managing Volumes" topic.

Step 2 Click **Create**.

Step 3 In the **Create Flexible Volume** dialog box, 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 check box to set security style as NTFS.
NFS Export check box	Check this check box to create NFS export path automatically.

Step 4 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.

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

Step 2 In the left pane, expand pods and select the NetApp Oncommand account to view the list of Filers in the account.

Step 3 Click the row of a filer and click **View Details**.
Cisco UCS Director displays information about the selected filer. Click the tabs in the window for more details about the filer component.

Step 4 Click the **SnapMirrors** tab.
Cisco UCS Director displays a list of SnapMirror relationships created in the account. The SnapMirror tab provides the following actions:

Name	Description
Refresh	Refreshes the current page.
Favorite	Adds this page to the **Favorites** tab which displays the page that you go to most often.
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

Step 1 Navigate to the **SnapMirrors** tab.
For more information about how to navigate to the **SnapMirrors** tab, see Managing SnapMirror Relationship, on page 37.

Step 2 Click **Create Connection**.

Step 3 In the **Configure** dialog box, 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.

Name	Description
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 4 Click **Submit**.

Scheduling a SnapMirror

Step 1 Navigate to the **SnapMirrors** tab.
For more information about how to navigate to the **SnapMirrors** tab, see Managing SnapMirror Relationship, on page 37.

Step 2 Click **Schedules**.

Step 3 In the **Schedules** window, do the following:

a) Click the **Add** icon in the **Schedules** pane.

b) In the **Add Entry to Schedule** dialog box, complete the following fields:

Name	Description
Source Location field	Click **Select** and choose the source locations 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.

Name	Description
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 4 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.

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

Step 2 In the left pane, choose the pod that includes the NetApp Oncommand account to view the list of filers.

Step 3 Click the filer and click **View Details**.
Cisco UCS Director displays information about the selected filer. Click the tabs in the window for more details about the filer component.

Step 4 Click the **Qtrees** tab.
Cisco UCS Director displays the Qtrees available in the account. The **QTree** tab provides the following actions:

Name	Description
Refresh	Refreshes the current page.
Favorite	Adds this page to the **Favorites** tab which displays the page that you go to most often.

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

Action	Description
Delete	Deletes a QTree.
Create Quota	Creates a quota in the QTree. **1** In the **Create Quota** window, complete the following fields: • **Volume Name** field—*Display-only*. The name of the volume. • **QTree Name** field—*Display-only*. The name of the QTree. • **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. **2** Click **Create**.

Creating a QTree

Step 1 Navigate to the **Volumes** tab.
For more information about how to navigate to the **Volumes** tab, see Managing Volumes, on page 33.

Step 2 Choose the volume in which you want to create the QTree.

Step 3 From the purple drop-down list, choose **Create QTree**.

Step 4 In the **Create QTree** dialog box, 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 5 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

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:

- VMs
- Aggregates
- Volumes
- QTrees
- 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 the **Disks** tab, all the disks that are available in that account are displayed. Choose a disk and 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.

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

Step 2 In the left pane, choose the pod that includes the NetApp ONTAP account.

Step 3 Click the **Filers** tab.
The filers available in the account are displayed. The **Filers** tab provides the following actions:

Action	Description
Refresh	Refreshes the current page.
Favorite	Adds this page to the **Favorites** tab which displays the page that you go to most often.

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

Action	Description
View Details	Displays information about the current status of the selected component. You can click the tabs in the window for more details about that 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.

Step 4 Click the filer and click **View Details**.
The **Storage Filer** window displays information about the selected filer. Click the tabs in the window to view more details about the filer component.

Managing Virtual Machines

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

Step 2 In the left pane, choose the pod that includes the NetApp ONTAP account and select the NetApp ONTAP account.

Step 3 Click the filer and click **View Details**.

Step 4 Click the **VMs** tab.
The VMs available in the filer are displayed. The **VMs** tab provides the following actions:

Action	Description
Refresh	Refreshes the current page.
Favorite	Adds this page to the **Favorites** tab which displays the page that you go to most often.

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	Launch 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—*Display Only*. 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: 1 **VM Name** field—*Display Only*. The name of the VM. 2 **Current Allocated CPU** field—*Display Only*. The current size of CPU allocated to the VM. 3 **Current Allocated Memory (GB)** field—*Display Only*. The current allocated memory of the VM. 4 **New CPU Count** drop-down list—Choose the new CPU size of the VM. 5 **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: 1 **VM Name** field—*Display Only*. The name of the VM. 2 **Task** field—*Display Only*. The task to be applied for the VM. 3 **Comments** field—Comments, if any. 4 **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: 1 **VM Name** field—*Display Only*. The name of the VM. 2 **Task** field—*Display Only*. The task to be applied for the VM. 3 **Comments** field—Comments, if any. 4 **Schedule Action** Pane—Choose **Execute Now** or **Execute Later** to turn off the VM immediately or later.

Managing Interfaces and Creating a vLAN

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

Step 2 In the left pane, choose the pod that includes the NetApp ONTAP account and select the NetApp ONTAP account.

Step 3 Click the filer and click **View Details**.
Cisco UCS Director displays information about the selected filer. Click the tabs in the window for more details about the filer component.

Step 4 Click the **Interfaces** tab.
Cisco UCS Director displays the interfaces available in the account. The interfaces tab provides the following actions:

Name	Description
Refresh	Refreshes the current page.
Favorite	Adds this page to the **Favorites** tab which displays the page that you go to most often.

Name	Description
Create VLAN	Creates a VLAN. To create a VLAN, complete the following fields in the **Create vLAN** dialog box: 1 **Select Interface** drop-down list—Choose a network interface from the list of interfaces that shows both physical interface and interface groups. 2 **vLAN ID** field—The VLAN ID from 1 to 4094. 3 Click **Create**.

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

Name	Description
View Details	Displays the service request details for the interface.
Delete	Deletes the interface.

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.

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

Step 2 In the left pane, choose the pod that includes the NetApp ONTAP account to view the list of Filers.

Step 3 Click the filer and click **View Details**.
Cisco UCS Director displays information about the selected filer. Click the tabs in the window for more details about the filer component.

Step 4 Click the **IP Spaces** tab.
Cisco UCS Director displays a list of IP spaces available in the filer. The **IP Spaces** tab provides the following actions:

Action	Description
Refresh	Refreshes the current page.
Favorite	Adds this page to the **Favorites** tab which displays the page that you go to most often.

Action	Description
Create	Creates an IP space in the filer.

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

Action	Description
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.

Adding an IP Space

Step 1 Navigate to the **Storage Filer** window.
For more information about how to navigate to the **Storage Filer** window, see Managing IP Spaces, on page 49.

Step 2 Click the **IP Spaces** tab.
Cisco UCS Director displays a list of IP spaces available in the filer.

Step 3 Click **Add**.
The **Create IP Space** dialog box appears.

Step 4 In the **IP Space Name** field, enter the IP space name.

Step 5 Click **Create**.

What to Do Next

Assign an IP space to a VLAN.

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.

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

Step 2 In the left pane, choose the pod that includes the NetApp ONTAP account to view the list of Filers in the account.

Step 3 Click the filer and click **View Details**.
Cisco UCS Director displays information about the selected filer. Click the tabs in the window for more details about the filer component.

Step 4 Click the **vFilers** tab.
The vFilers available under the account are displayed. The **vFiler** tab provides the following actions:

Action	Description
Refresh	Refreshes the current page.
Favorite	Adds this page to the **Favorites** tab which displays the page that you go to most often.
Create	Creates a vFiler in the NetApp ONTAP account.

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

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.

Action	Description
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**: 1 **Group** drop-down list—Choose a group to which the vFiler has to be assigned. 2 **Label** field—The label for the assigned group.
Add Hosts	Adds a host to the vFiler. Provide inputs for the following fields and click **Submit**: 1 **Host IP** field—The Host IP address. 2 **Host Name** field—The name of the host.

Creating a vFiler

Before You Begin

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

Step 1 Navigate to the **vFiler** tab.
For more information about how to navigate to the **vFiler** tab, see Managing vFilers, on page 51.

Step 2 Click **Create**.

Step 3 In the **Create vFiler** dialog box, 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 (ipspaces) 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 drop-down list	Choose the storage unit from the list.

Step 4 Click **Create**.

Setting up a vFiler

Step 1 Navigate to the **vFiler** tab.
For more information about how to navigate to the **vFiler** tab, see Managing vFilers, on page 51.

Step 2 Click the vfiler and click **Setup**.

Step 3 In the **Setup vFiler** dialog box, complete the following fields:

Name	Description
vFiler Name field	*Display Only*. The name of the vFiler.
Subnet Mask field	The subnet mask of the vFiler.
DNS Domain field	The DNS domain.
DNS Server Addresses field	DNS server IP addresses separated by comma.
Default Gateway field	The default gateway IP address.
Interface Name drop-down list	Choose a VLAN interface.
Protocols field	Click **Select** and choose the protocols that the vFiler supports: • **NFS** • **CIFS** • **iSCSI**

Step 4 Click **Submit**.

Setting up a CIFS Server for a vFiler

Step 1 Navigate to the **vFiler** tab.
For more information about how to navigate to the **vFiler** tab, see Managing vFilers, on page 51.

Step 2 Click the vfiler and click **Setup CIFS**.

Step 3 In the **Setup CIFS** dialog box, complete the following fields:

Name	Description
vFiler Name field	*Display Only*. The name of the vFiler.
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, for example, cifsdomain, cifs.domain.com.
Login User 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 Password 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.
Organization Unit field	The password of the login user.
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 4 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.

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

Step 2 In the left pane, choose the pod that includes the NetApp ONTAP account to view the list of Filers.

Step 3 Click the filer and click **View Details**.
Cisco UCS Director displays information about the selected filer. Click the tabs in the window for more details about the filer component.

Step 4 Click the **Aggregates** tab.
Cisco UCS Director displays the Aggregates available in the account. The **Aggregate** tab provides the following actions:

Name	Description
Refresh	Refreshes the current page.
Favorite	Adds this page to the **Favorites** tab which displays the page that you go to most often.
Create	Creates an aggregate in the NetApp ONTAP account.

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

Action	Description
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 Tag	Adds a tag to the aggregate, edit the assigned tag, and delete 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.

Action	Description
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

Step 1 Navigate to the **Aggregates** tab.
For more information about how to navigate to the **Aggregates** tab, see Managing Aggregates, on page 55.

Step 2 Click **Create**.

Step 3 In the **Create Aggregate** dialog box, complete the following fields:

Name	Description
Aggregate Name field	The name of the aggregate.
Disk Count field	The number of disks in the aggregate.
Disk List button	Selects the disks.
Raid Type drop-down list	Choose the RAID type.

Step 4 Click **Submit**.

Managing Initiator Groups

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

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

Step 2 In the left pane, choose the pod that includes the NetApp ONTAP account and select the account to view the list of Filers in the account.

Step 3 Click the filer and click **View Details**.
Cisco UCS Director displays information about the selected filer. Click the tabs in the window for more details about the filer component.

Step 4 Click the **Initiators Groups** tab.
Cisco UCS Director displays the initiator groups available in the account. The **Initiator Groups** tab provides the following actions:

Action	Description
Refresh	Refreshes the current page.
Favorite	Adds this page to the **Favorites** tab which displays the page that you go to most often.
Create	Creates an initiator group in the NetApp ONTAP account.

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.
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

Step 1 Navigate to the **Initiator Groups** tab.
For more information about how to navigate to the **Initiators Groups** tab, see Managing Initiator Groups, on page 57.

Step 2 Click **Create**.

Step 3 In the **Create Initiator Group** dialog box, 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 4 Click **Create**.

Adding an Initiator

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

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

Step 2 In the left pane, choose the pod that includes the NetApp ONTAP account and select the account to view the list of filers.

Step 3 Click the filer and click **View Details**.
Cisco UCS Director displays information about the selected filer. Click the tabs in the window for more details about the filer component.

Step 4 Click the **Initiators** tab.
You can add a new initiator to an initiator group using the **Create** option or remove it from an initiator group using the **Delete** option.

Step 5 To create a new initiator, click **Create**.

Step 6 In the **Create Initiator** dialog box, 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	A unique name that you assign to this initiator.
Force check box	Check this check box to forcibly add the initiator to the group.

Step 7 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).

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

Step 2 In the left pane, choose the pod that includes the NetApp ONTAP account and select the NetApp ONTAP account.

Step 3 Click the filer and click **View Details**.

Step 4 Click the **LUNs** tab.
The LUNs available in the volume are displayed. The **LUNs** tab provides the following actions:

Action	Description
Refresh	Refreshes the current page.
Favorite	Adds this page to the **Favorites** tab which displays the page that you go to most often.
Create	Creates an LUN in the NetApp ONTAP account.

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

Action	Description
View Details	Displays summary and service request details of the LUN.

Action	Description
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.
Unmap iGroup	Unmaps the iGroup from the selected LUN.
Resize	Resizes the LUN. To resize the LUN, complete the following fields: 1 **LUN Name** field—*Display Only*. The name of the LUN. 2 **Current LUN Size** field—*Display Only*. The current size of the LUN. 3 **New Size** field—The required size of the LUN. 4 **Size Units** 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

Step 1 Navigate to the **LUNs** tab.

For more information about how to navigate to the **LUNs** tab, see Managing LUNs, on page 59.

Step 2 Click **Create**.

Step 3 In the **Create LUN** dialog box, complete the following fields:

Name	Description
Select Volume drop-down list	Choose the volume in which you want to create the LUN.
LUN Name field	The name of the LUN.
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 check box to manage the space usage manually and to create a LUN without any space being reserved.

Step 4 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.

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

Step 2 In the left pane, choose the pod that includes the NetApp ONTAP account to view the list of Filers.

Step 3 Click the filer and click **View Details**.
Cisco UCS Director displays information about the selected filer. Click the tabs in the window for more details about the filer component.

Step 4 Click the **Volumes** tab.
Cisco UCS Director displays the volumes available in the account. The **Volumes** tab provides the following actions:

Action	Description
Refresh	Refreshes the current page.
Favorite	Adds this page to the **Favorites** tab which displays the page that you go to most often.

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

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

Action	Description
View Details	Displays a summary of the volume. Click the tabs in the window for more details about the following volume component: • Qtrees • LUNs • Snapshot • Service request details
Delete	Deletes the volume.
Online	Moves the volume to the online state.
Offline	Moves the volume to the offline state.
Resize	Resizes an existing volume. To resize the volume, complete the following fields: 1 **Volume Name** field—*Display Only*. The name of the volume. 2 **Current Volume Size**—*Display Only*. The current size of the volume in GB. 3 **New Size** field—The required size of the volume. 4 **Size Units** drop-down list—Choose the size of the volume as **MB**, **GB**, or **TB**. 5 **File System Size Fixed** check box—Check this check box to fix the file system size.
Dedup On	Enables data deduplication on the volume.
Dedup Off	Disables data deduplication on the volume.

Action	Description
NFS Export	Exports the volume as a file through NFS. To export the volume, complete the following fields: 1 **Actual Path** field—*Display Only*. The actual path of the selected Volume. 2 **Export Path** field—The path where the volume should be mounted in the UNIX environment. 3 **Read-Write Hosts** field—The comma-separated list of hosts that have read write access to the volume. 4 **Root Hosts** field—The comma-separated list of hosts that have root access to the volume. 5 **Security** drop-down list—Choose the security applicable for this export. 6 **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: 1 **Volume Name** field—*Display Only*. The name of the selected volume. 2 **Snapshot Name** field—The name of the Snapshot. 3 **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. 4 **Async** check box—Check this check box to create the snapshot asynchronously.
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. 1 **Current Snapshot Reserved (%)**—*Display Only*. The current percentage of volume space reserved for snapshots. 2 **New Percentage (%)**—The percentage of volume space to be reserved for snapshots.

Creating a Volume

Step 1 Navigate to the **Volumes** tab.
For more information about how to navigate to the **Volumes** tab, see the "Managing Volumes" topic.

Step 2 Click **Create**.

Step 3 In the **Create Flexible Volume** dialog box, complete the following fields:

Name	Description
Aggregate pane	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	The name of the volume.
Volume Size field	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	The snapshot size as a percentage.
Security Style NTFS check box	Check this check box to set the security style as NTFS.
NFS Export check box	Check this check box to create the NFS export path automatically.

Step 4 Click **Create**.

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.

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

Step 2 In the left pane, choose the pod that includes NetApp ONTAP account to view the list of Filers in the account.

Step 3 Click the filer and click **View Details**.
Cisco UCS Director displays information about the selected filer. Click the tabs in the window for more details about the filer component.

Step 4 Click the **SnapMirrors** tab.
Cisco UCS Director displays a list of SnapMirror relationships that are created in the account. The **SnapMirror** tab provides the following actions:

Name	Description
Refresh	Refreshes the current page.
Favorite	Adds this page to the **Favorites** tab which displays the page that you go to most often.
Create Connection	Sets up a new 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.

When you choose 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 the inventory on a schedule.

Action	Description
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

Step 1 Navigate to the **SnapMirrors** tab.
For more information about how to navigate to the **SnapMirrors** tab, see Managing SnapMirror Relationships, on page 65.

Step 2 Click **Create Connection**.

Step 3 In the **Configure** dialog box, 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.

Name	Description
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 4 Click **Submit**.

Scheduling a SnapMirror Relationship

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

Step 2 In the left pane, choose the pod that includes the NetApp ONTAP account and select the account.

Step 3 Click the filer and click **View Details**.
Cisco UCS Director displays information about the selected filer. Click the tabs in the window for more details about the filer component.

Step 4 Click the **SnapMirrors** tab.

Step 5 Click **Schedules**.

Step 6 In the **Schedules** window, do the following:

a) Click the **Add** icon in the **Schedules** pane.

b) In the **Add Entry to Schedule** dialog box, complete the following fields and click **Submit**.

Name	Description
Source Location field	Click **Select** and choose the source locations 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.

Name	Description
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**.

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.

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

Step 2 On the left pane, choose the pod that includes the NetApp ONTAP account.
The NetApp ONTAP account displays the list of Filers in the account.

Step 3 Choose the filer and then click **View Details**.
Cisco UCS Director displays information about the selected filer.

Step 4 Click the **SnapVault** tab.
Cisco UCS Director displays a list of SnapVault relationships that have been created on the filer. For each SnapVault relationship, the SnapVault tab displays information such as the source volume, the destination volume, the source system, transfer rate, and tries count.

The **SnapVault** tab provides the following actions:

Name	Description
Refresh	Refreshes the current page.
Favorite	Adds this page to the **Favorites** tab.
Create	Sets up a new SnapVault relationship.

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

Action	Description
Delete	Deletes the SnapVault relationship.
Modify	Updates an existing SnapVault relationship.
Release	Releases the SnapVault relationship.
Abort	Aborts the SnapVault transfer before it is complete.
Update	Starts a fresh SnapVault transfer.
Restore	Restores the previous SnapVault relationship.

Creating a SnapVault Relationship

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

Step 2 On the left pane, choose the pod that includes the NetApp ONTAP account.
The NetApp ONTAP account displays the list of Filers in the account.

Step 3 Choose the filer and then click **View Details**.
Cisco UCS Director displays information about the selected filer.

Step 4 Click the **SnapVault** tab.
Cisco UCS Director displays a list of SnapVault relationships that have been created on the filer.

Step 5 On the SnapVault tab, click **Create**.
The Create SnapVault dialog box appears.

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

Name	Description
Source Path drop-down list	Choose the source qtree from which the data has to be transferred.
Destination Path 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 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 7 Click **Submit**.

Viewing Schedules and Status History of SnapVault Relationships

You can view the schedules and status history of the SnapVault relationships through the SnapMirrors tab.

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

Step 2 On the left pane, choose the pod that includes the NetApp ONTAP account.
The NetApp ONTAP account displays the list of Filers in the account.

Step 3 Choose the filer and then click **View Details**.
Cisco UCS Director displays information about the selected filer.

Step 4 Click the **SnapVault** tab.
Cisco UCS Director displays a list of SnapVault relationships that have been created on the filer. For each SnapVault relationship, the SnapVault tab displays information such as the source volume, the destination volume, the source system, transfer rate, and tries count.

Step 5 Double-click the SnapVault relationship for which you want to view the schedules and status history.
By default, the **Schedules** report appears. The Schedules report displays the available schedules for the selected SnapVault relationship.

Step 6 To view the status history of the SnapVault relationship, from the **Report** list, select **Status History**.
The **Status History** report displays the status of the schedules for the selected SnapVault relationship.

Creating CIFS Shares

Step 1 Navigate to the **Volumes** tab.
For more information about how to navigate to the **Volumes** tab, see Managing Volumes, on page 61.

Step 2 Click the volume.

Step 3 Choose **Create CIFS Share** from the drop-down list.

Step 4 In the **Add CIFS Share** dialog box, complete the following fields:

Name	Description
Share Name field	A unique name that you assign to the CIFS share.
Comment field	Comments, if any.

Step 5 Click **Share**.

Setting CIFS Share Access

Step 1 Navigate to the **Volumes** tab.
For more information about how to navigate to the **Volumes** tab, see Managing Volumes, on page 61.

Step 2 Click the Volume.
You get various actions to perform on the selected volume.

Step 3 Expand the drop-down list and choose **Set CIFS Share Access**.

Step 4 In the **Set CIFS Share Access** dialog box, complete the following fields:

Name	Description
Volume Name field	*Display-only* field. The name of the volume.
Share Name drop-down list	Choose the share for which you want to provide access.

Name	Description
Select Role drop-down list	Choose the role from the available list.
Role ID field	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	Comments, if any.

Step 5 Click **Submit**.

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.

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

Step 2 In the left pane, choose the pod that includes the NetApp ONTAP account and select the account to view the list of filers.

Step 3 Click the filer and click **View Details**.
Cisco UCS Director displays information about the selected filer. Click the tabs in the window for more details about the filer component.

Step 4 Click the **Qtrees** tab.
Cisco UCS Director displays the Qtrees available in the account. The QTree tab provides the following actions:

Name	Description
Refresh	Refreshes the current page.
Favorite	Adds this page to the **Favorites** tab which displays the page that you go to most often.

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: • **Volume Name—***Display Only*. The name of the volume. • **QTree Name—***Display Only*. The name of the QTree. • **Disk Space Hard Limit (GB) —**The maximum disk space value in GB. • **Disk Space Soft Limit (GB)—**The soft limit disk space value in GB. • **Files Hard Limit—**The maximum number of files in the quota. • **Files Soft Limit—**The soft limit for the number of files in the quota. • **Threshold (GB)—**The threshold limit disk space value in GB. • **Quota Type—**Choose **Tree** from the drop-down list.

Creating a QTree

Step 1 Navigate to the **QTrees** tab.
For more information about how to navigate to the **QTrees** tab, see the "Managing QTrees and Creating Quotas" topic.

Step 2 To create a new QTree, click the **Volumes** tab and select the volume in which you want to create the QTree.

Step 3 Choose **Create QTree** from the purple drop-down list on the right pane.

Step 4 In the **Create QTree** dialog box, complete the following fields:

a) In the **QTree Name** field, enter the name of the QTree.

b) 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.

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

Step 2 In the left pane, choose the pod that includes the NetApp ONTAP account and select the ONTAP account.

Step 3 Click the **System Tasks** tab.
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.

CHAPTER 6

Monitoring and Reporting for a Cluster Mode Account

This chapter contains the following sections:

• Managing Licenses, page 125

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
- 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 the **Disks** tab, all the disks that are available in that account are displayed. Choose a disk and click **View Details** to view the summary details of the disk.

Adding a License

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

Step 2 In the left pane, choose the pod that includes the NetApp C-Mode account and select the NetApp C-Mode account.

Step 3 Click the **Licenses** tab.
The licenses available under the account are displayed.

Step 4 Click **Add**.

Step 5 In the **Add License to Cluster** dialog box, enter a license code in the **License Code** field.

Step 6 Click **Submit**.

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.

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

Step 2 In the left pane, choose the pod that includes the NetApp C-Mode account and select the NetApp C-Mode account.

Step 3 Click the **Logical Interfaces** tab.
The LIFs created in the account are displayed. The **Logical Interfaces** tab provides the following actions:

Action	Description
Refresh	Refreshes the current page.
Favorite	Adds this page to the **Favorites** tab which displays the page that you go to most often.
Create LIF	Creates a logical interface on a single SVM.

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.
Modify LIF	Updates the following values of the LIF: home node, home port, IP address, subnetmask, 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.

Creating a Logical Interface

Step 1 Navigate to the **Logical Interfaces** tab.
For more information about how to navigate to the Logical Interfaces tab, see Managing Interface Groups, on page 81.

Step 2 Click **Create**.

Step 3 In the **Create LIF** dialog box, 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 field	Click **Select** and choose the SVM.
Home Node drop-down list	Choose a node from the drop-down list.
Allowed Protocols field	Click **Select** and choose the allowed protocols from the following list: • **NFS** • **CIFS** • **Flexcache** • **iSCSI** • **FCP**
Logical Interface Name field	The name of the logical interface.
IP Address field	The IP address of the network.
Subnet mask field	The subnet mask of the network.
Failover Policy drop-down list	Choose any one of the following as the failover policy for the LIF: • **Nextavail** • **Disabled** • **Priority** **Note** For FCP and iSCSI LIFs, the failover policy is Disabled. For CIFS and fcache LIFs, the default policy is Nextavail.
Use Failover Group drop-down list	Choose any one of the following as the failover group type to specify whether the failover rules are system defined, manually created by the administrator, or disabled: • **System-defined** • **Disabled** • **Enabled**

Name	Description
Failover Group drop-down list	This field is applicable only when **Enabled** is selected as the Use Failover Group. Choose the failover group to specify the failover group created by the administrator.

Step 4 Click **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 that it is currently bound to.

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

Step 2 In the left pane, choose the pod that includes the NetApp C-Mode account and select the NetApp C-Mode account.

Step 3 Click the **Ports** tab.

Step 4 Select the row of a port that you want to configure and click **Configure Port**.

Step 5 In the **Configure Port** dialog box, complete the following fields:

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

Step 6 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.

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

Step 2 In the left pane, choose the pod that includes the NetApp C-Mode account and select the NetApp C-Mode account.

Step 3 Click the **Interface Groups** tab.
The Interface Groups created in the account are displayed. The **Interface Groups** tab provides the following actions:

Action	Description
Refresh	Refreshes the current page.
Favorite	Adds this page to the **Favorites** tab which displays the page that you go to most often.
Create	Create a new interface group.

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

Action	Description
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

Step 1 Navigate to **Interface Groups** tab.
For more information about how to navigate to the **Interface groups** tab, see Managing Interface Groups, on page 81.

Step 2 Click **Create**.

Step 3 In the **Create IfGroup** dialog box, complete the following fields:

Name	Description
Node Name drop-down list	Choose the node name in which an interface group needs to be created.

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

Step 4 Click **Submit**.

Managing VLANs

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

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

Step 2 In the left pane, choose the pod that includes the NetApp C-Mode account and select the NetApp C-Mode account.

Step 3 Click the **vLANs** tab.
The VLANs created in the account are displayed. The **vLANs** tab provides the following actions:

Action	Description
Refresh	Refreshes the current page.
Favorite	Adds this page to the **Favorites** tab which displays the page that you go to most often.

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

When you choose a VLAN, the **Delete** action appears.

Creating vLANs

Step 1 Navigate to the **vLANs** tab.
For more information about how to navigate to the **vLANs** tab, see Managing VLANs, on page 82.

Step 2 Click **Create**.

Step 3 In the **Create vLAN** dialog box, 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	The VLAN ID. The valid range of the VLAN ID is from 1 to 4094.

Step 4 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. Once you have added disks to an aggregate, you cannot remove them to reduce storage space without deleting the aggregate.

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

Step 2 In the left pane, choose the pod that includes the NetApp C-Mode account and select the NetApp C-Mode account.

Step 3 Click the **Aggregates** tab.
The aggregates available under the account are displayed. The **Aggregates** tab provides the following actions:

Action	Description
Refresh	Refreshes the current page.
Favorite	Adds this page to the **Favorites** tab which displays the page that you go to most often.
Create	Creates an aggregate on a selected node.

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

Action	Description
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.
Manage Tag	Adds a tag to the aggregate, edit the assigned tag, and delete 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

Step 1 Navigate to the **Aggregates** tab.
For more information about how to navigate to the **Aggregates** tab, see Managing Aggregates, on page 83.

Step 2 Click **Create**.

Step 3 In the **Create Aggregate** dialog box, complete the following fields:

Name	Description
Aggregate Name field	The name of the aggregate.
Disk Count field	The number of disks in the aggregate.
Node Name field	Click **Select** and choose the nodes on which aggregate to be created.
Disk List field	Click **Select** and choose the disks to be aggregated.
Raid Type drop-down list	Choose the RAID type from the list.

Step 4 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.

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

Step 2 In the left pane, choose the pod that includes the NetApp C-Mode account and select the NetApp C-Mode account.

Step 3 Click the **SVMs** tab.
The SVMs available under the account are displayed. The **SVMs** tab provides the following actions:

Action	Description
Refresh	Refreshes the current page.
Favorite	Adds this page to the **Favorites** tab which displays the page that you go to most often.

Action	Description
Create	Creates SVM on one of the nodes in a cluster account.

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

Action	Description
Modify	Updates an existing SVM.
Delete	Deletes an existing SVM.
Start	Starts the SVM.
Stop	Stops the SVM.
Create Routing Group	Creates a routing group. To create a routing group, complete the following fields: • **Routing Group** field—The name for the routing group. • **Destination Address** field—The IP address and subnet mask of the destination. For example, 192.168.1.0/24. • **Gateway Address** field—The IP address of the gateway. For example, 192.168.1.1. • **Metric** field—The metric (hop count) of the LIF.
Start NFS Service	Starts the NFS service.
Stop NFS Service	Stops the NFS service.
The following additional options appear in the drop-down icon:	
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.

Action	Description
Assign Group	Assigns the SVM to a user or user group.
Manage Tag	Adds a tag to the SVM, edit the assigned tag, and delete the tag from the SVM group. **Note** The tags for which the Taggable Entities are assigned during creation are displayed.
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.
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 tab library, see Cisco UCS Director Administration Guide.

Creating SVMs

Step 1 Navigate to the **SVMs** tab.
For more information about how to navigate to the **SVMs** tab, see Managing SVMs, on page 85.

Step 2 Click **Create**.

Step 3 In the **Create SVM** dialog box, complete the following fields:

Name	Description
SVM Name field	The name of the SVM.
Name Service Switch drop-down list	Choose the name service switch from the list.
Volume Name field	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 from the list.

Name	Description
Protocols field	Click **Select** and choose one or all of the protocols that the SVM supports: • **NFS** • **CIFS** • **iSCSI** • **FCP**
Snapshot Policy field	Click **Select** and choose one or more of the snapshot policies for the SVM.

Step 4 Click **Submit**.

What to Do Next

After creating the SVM, expand the purple drop-down list icon on the right pane and 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.

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

Step 2 In the left pane, choose the pod that includes the NetApp C-Mode account and select the account.

Step 3 Click the **SVMs** tab.

Step 4 Click the SVM for which you wish to view details and choose **View Details** from the purple drop-down list on the right pane.

Step 5 Click the **Volumes** tab.
The volumes available in the SVM appear. The **Volumes** tab provides the following actions:

Action	Description
Refresh	Refreshes the current page.
Favorite	Adds this page to the **Favorites** tab which displays the page that you go to most often.
Create	Creates a volume in the NetApp C-Mode account.

Action	Description
Create Multi-Snapshot	Creates a multi-snapshot for the volume. To create a multi-snapshot, do the following in the **Create Multi-Volume Snapshot** dialog box: **1** Click **Select** and check the check boxes for the volumes that you want to select. **2** In the **Snapshot Name** field, enter a name for the snapshot. **3** Click **Submit**.

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

Action	Description
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.
Resize	Resizes the volume. To resize the volume, complete the following fields: **1** **Volume Name** field—*Display Only*. The name of the volume. **2** **Current Volume Size**—*Display Only*. The current size of the volume in GB. **3** **New Size** field—The required size of the volume. **4** **Size Units** drop-down list—Choose the size of the volume as **MB**, **GB**, or **TB**.
Clone Volume	Clones the volume. In the **Clone Cluster Volume** dialog box, enter the volume name and select the parent snapshot.
Mount	Mounts the volume on the specified junction path. The junction path should start with / and should not end with /.
Unmount	Unmounts the volume.

Action	Description
Move	Moves the volume to the selected aggregate.
Enable Dedupe	Enables data deduplication on the volume to remove duplicate entries.

Creating a Volume within SVM

Step 1 Navigate to the **Volumes** tab.
For more information about how to navigate to the **Volumes** tab, see the "Managing Volumes in SVM" topic.

Step 2 Click **Create**.

Step 3 In the **Create Volume** dialog box, complete the following fields:

Name	Description
Volume Type drop-down list	Choose the type of volume.
Volume Name field	The name of the volume.
Volume Size field	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	The snapshot size as a percentage to be used by the volume.
Export Policy drop-down list	Choose the export policy.
Snapshot Policy field	Click **Select** and choose a snapshot policy for the volume.

Step 4 Click **Submit**.

Managing Volume LIF Association

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

Step 2 In the left pane, choose the pod that includes the NetApp C-Mode account and select the C-Mode account.

Step 3 Click the **SVMs** tab.

Step 4 Click the SVM for which you wish to view details and click **View Details** from the purple drop-down list on the right pane.

Step 5 Click the **Volume LIF Association** tab.
The LIFs that are associated with volumes available in the SVM account are displayed. The **Volume LIF Association** tab provides the following actions:

Action	Description
Refresh	Refreshes the current page.
Favorite	Adds this page to the **Favorites** tab which displays the page that you go to most often.

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).

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

Step 2 In the left pane, choose the pod that includes the NetApp C-Mode account and select the NetApp C-Mode account.

Step 3 Click the **SVMs** tab.

Step 4 Click the SVM for which you wish to view details and click **View Details** from the drop-down list on the right pane.

Step 5 Click the **LUNs** tab.
The LUNs available in the SVM are displayed. The **LUNs** tab provides the following actions:

Action	Description
Refresh	Refreshes the current page.
Favorite	Adds this page to the **Favorites** tab which displays the page that you go to most often.
Create	Creates an LUN in the NetApp C-mode account.

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

Action	Description
Delete	Deletes a LUN. Check the **Force** check box in the **Destroy LUN** dialog box to allow a force deletion of the LUN.
Resize	Resizes the LUN within the volume. To resize the LUN, complete the following fields: 1 **LUN Size** field—The required size of the LUN. 2 **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: 1 **LUN Name** field—*Display Only*. The name of the LUN. 2 **Snapshot Clone** checkbox—Check this check box to clone the LUN from the snapshot. 3 **New LUN Name** field—The new LUN name.
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 the **Initiator Group** drop-down list. Check the **Specify LUN ID** check 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.

Creating a LUN

Step 1 Navigate to the **LUNs** tab.
For more information about how to navigate to the LUNs tab, see Managing LUNs, on page 91.

Step 2 Click **Create**.

Step 3 In the **Create LUN** dialog box, complete the following fields:

Name	Description
Select Volume drop-down list	Choose the volume to which the LUN belongs.
LUN Name field	The name of the LUN.
Size field	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 4 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.

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

Step 2 In the left pane, choose the pod that includes the NetApp C-Mode account and select the NetApp C-Mode account.

Step 3 Click the **SVMs** tab.

Step 4 Click the SVM for which you wish to view details and click **View Details** from the drop-down list on the right pane.

Step 5 Click the **QTrees** tab.
The Qtrees available under the account are displayed. The **QTrees** tab provides the following actions:

Action	Description
Refresh	Refreshes the current page.
Favorite	Adds this page to the **Favorites** tab which displays the page that you go to most often.

Action	Description
Create Qtree	Creates a qtree.

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.

Creating Qtrees

Step 1 Navigate to the **QTrees** tab.
For more information about how to navigate to the **QTrees** tab, see the "Managing Qtrees" topic.

Step 2 Click **Create QTree**.

Step 3 In the **Create QTree** dialog box, do the following:

a) In the **Volume Name** field, click **Select** and choose the volume in which you want to create the Qtree.
b) In the **Qtree Name** field, enter the name of the Qtree.
c) 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.

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

Step 2 In the left pane, choose the pod that includes the NetApp C-Mode account and select the NetApp C-Mode account.

Step 3 Click the **SVMs** tab.

Step 4 Click the SVM for which you wish to view details and click **View Details** from the purple drop-down list on the right pane.

Step 5 Click the **Quotas** tab.
The quotas available in the SVM account are displayed. The **Quotas** tab provides the following actions:

Action	Description
Refresh	Refreshes the current page.
Favorite	Adds this page to the Favorites tab which displays the page that you go to most often.
Create Quota	Creates a quota for a qtree in the SVM account.

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

Action	Description
Remove Quota	Removes quota of the qtree after confirmation.
Modify Quota	Updates the quota of the qtree.

Creating a Quota

Step 1 Navigate to the **Quotas** tab.
For more information about how to navigate to the **Quotas** tab, see Managing Quotas, on page 95.

Step 2 Click **Create Quota**.

Step 3 In the **Create Quota** dialog box, complete the following fields:

Action	Description
Qtree Name field	Click **Select** and choose a qtree for which the quota needs to be created.
Quota Type drop-down list	Choose **Tree** from the drop-down list.
Disk Space Hard Limit (GB) field	The maximum disk space value in GB.
Files Hard Limit field	The maximum number of files in the quota.
Threshold (GB) field	The threshold limit for the disk space value in GB.
Disk Space Soft Limit (GB) field	The soft quota for the maximum number of files in GB.
Files Soft Limit field	The soft limit for the number of files in the quota.

Managing Initiator Groups

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

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

Step 2 In the left pane, choose the pod that includes the NetApp C-Mode account and select the NetApp C-Mode account.

Step 3 Click the **SVMs** tab.

Step 4 Click the SVM for which you wish to view details and click **View Details** from the drop-down list on the right pane.

Step 5 Click the **Initiator Groups** tab.
The initiator groups available under the account are displayed. The **Initiator Groups** tab provides the following actions:

Action	Description
Refresh	Refreshes the current page.
Favorite	Adds this page to the Favorites tab which displays the page that you go to most often.
Create	Creates an initiator group.

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

Action	Description
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

Step 1 Navigate to the **Initiator Groups** tab.
For more information about how to navigate to the **Initiator Groups** tab, see Managing Initiator Groups, on page 96.

Step 2 Click **Create**.

Step 3 In the **Create Initiator Group** dialog box, complete the following fields:

Name	Description
Initiator Group Name field	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 field	Click **Select** and choose port set from the table.

Step 4 Click **Submit**.

Managing Initiators

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

Step 2 In the left pane, choose the pod that includes the NetApp C-Mode account and select the NetApp C-Mode account.

Step 3 Click the **SVMs** tab.

Step 4 Choose the SVM for which you wish to view details and click **View Details** from the drop-down list on the right pane.

Step 5 Click the **Initiators** tab.
The initiators available under the account are displayed. The **Initiators** tab provides the following actions:

Action	Description
Refresh	Refreshes the current page.
Favorite	Adds this page to the **Favorites** tab which displays the page that you go most often.
Create	Adds an initiator to an initiator group.

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

Action	Description
Delete	Removes an initiator. Check the **Force** check box to force delete the initiator. **Note** You cannot delete an initiator if LUN maps exists for the initiator group.

Adding an Initiator

Step 1 Navigate to the **Initiators** tab.
For more information about how to navigate to the **Initiators** tab, see Managing Initiators, on page 98.

Step 2 Click **Create**.

Step 3 In the **Create Initiator** dialog box, complete the following fields:

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

Name	Description
Initiator Name field	The name of the initiator.
WWPN alias field	Click **Select** and check the check boxes of the WWPN alias for the initiator.
Force check box	Check this check box to forcibly add the initiator.

Step 4 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.

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

Step 2 In the left pane, choose the pod that includes the NetApp C-Mode account and select the NetApp C-Mode account.

Step 3 Click the **SVMs** tab.

Step 4 Choose the SVM for which you want to view details and click **View Details** from the drop-down list on the right pane.

Step 5 Click the **CIFS Shares** tab.
The CIFS shares available in the SVM are displayed. The **CIFS Shares** tab provides the following actions:

Action	Description
Refresh	Refreshes the current page.
Favorite	Adds this page to the **Favorites** tab which displays the page that you go to most often.
Create	Creates a CIFS share in the NetApp C-mode account.

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

Action	Description
Delete	Deletes a CIFS share.
Modify	Updates the volume path and comment of the CIFS share.

Action	Description
Set Share Access	Creates a CIFS share access. To create CIFS share access, complete the following fields: 1 **Permission** drop-down list—Choose the level of access permission from the list. 2 **User or Group** field—The user or group name for which the permissions are listed. 3 **Comment** field—Comments, if any.
Delete Share Access	Deletes the CIFS share access.
Modify Share Access	Updates the permission to access the CIFS share.

Creating CIFS Shares

Step 1 Navigate to the **CIFS Share** tab.
For more information about how to navigate to the **CIFS Share** tab, see Managing CIFS Shares , on page 99.

Step 2 Click **Create**.

Step 3 In the **Create CIFS Share** dialog box, 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	The name of the CIFS share.
Comment field	Comments, if any.
Set Share Access check box	Check the check box to provide access to the CIFS share.

Managing DNS

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

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

Step 2 In the left pane, choose the pod that includes the NetApp C-Mode account and select the NetApp C-Mode account.

Step 3 Click the **SVMs** tab.

Step 4 Click the SVM for which you wish to view details and click **View Details** from the purple drop-down list on the right pane.

Step 5 Click the **DNS** tab.
The DNS configured in the SVM account are displayed. The **DNS** tab provides the following actions:

Action	Description
Refresh	Refreshes the current page.
Favorite	Adds this page to the **Favorites** tab which displays the page that you go to most often.

Managing IP Hostname

You can view the IP address and name of hosts in the SVM account.

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

Step 2 In the left pane, choose the pod that includes the NetApp C-Mode account and select the NetApp C-Mode account.

Step 3 Click the **SVMs** tab.

Step 4 Click the SVM for which you wish to view details and click **View Details** from the purple drop-down list on the right pane.

Step 5 Click the **IP Hostname** tab.
The SVM name, IP address, and hostname in the SVM account are displayed. The **IP Hostname** tab provides the following actions:

Action	Description
Refresh	Refreshes the current page.
Favorite	Adds this page to the **Favorites** tab which displays the page that you go to most often.

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.

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

Step 2 In the left pane, choose the pod that includes the NetApp C-Mode account and select the C-Mode account.

Step 3 Click the **SVMs** tab.

Step 4 Click the SVM for which you wish to view details and click **View Details** from the purple drop-down list on the right pane.

Step 5 Click the **SIS Policies** tab.
The SIS policies available in the SVM account are displayed. The **SIS Policies** tab provides the following actions:

Action	Description
Refresh	Refreshes the current page.
Favorite	Adds this page to the **Favorites** tab which displays the page that you go to most often.
Create	Creates a SIS policy in the SVM account.

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

Action	Description
Delete	Deletes a SIS policy after confirmation.
Modify	Updates the SIS policy.

Creating a SIS Policy

Step 1 Navigate to the **SIS Policies** tab.

For more information about how to navigate to the **SIS Policies** tab, see Managing SIS Policy, on page 102.

Step 2 Click **Create**.

Step 3 In the **Create sis Policy on SVM** dialog box, do the following:

Name	Description
SIS policy name field	The name of the SIS policy.
Enabled drop-down list	Choose **true** to enable SIS policy on the SVM.
QOS Policy field	Choose **best-effort** or **background** as the QoS policy.
Duration field	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	Comments, if any.

Step 4 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.

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

Step 2 In the left pane, choose the pod that includes the NetApp C-Mode account and select the NetApp C-Mode account.

Step 3 Click the **SVMs** tab.

Step 4 Click the SVM for which you wish to view details and click **View Details** from the drop-down list on the right pane.

Step 5 Click the **Export Policies** tab.
The export policies available under the account are displayed. The **Export Policies** tab provides the following actions:

Action	Description
Refresh	Refreshes the current page.
Favorite	Adds this page to the **Favorites** tab which displays the page that you go to most often.
Create	Creates an export rule.

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

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

Managing Export Rules

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

At least one export rule need 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 rule index. The permissions defined in a rule are applied to the clients that match the client match criteria specified in the export rule.

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

Step 2 In the left pane, choose the pod that includes the NetApp C-Mode account and select the NetApp C-Mode account.

Step 3 Click the **SVMs** tab.

Step 4 Click the SVM for which you wish to view details and click **View Details** from the drop-down list on the right pane.

Step 5 Click the **Export Rules** tab.
The export rules available under the account are displayed. The **Export Rules** tab provides the following actions:

Action	Description
Refresh	Refreshes the current page.
Favorite	Adds this page to the **Favorites** tab which displays the page that you go to most often.
Create	Creates an export rule.

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

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

Creating an Export Rule

Step 1 Navigate to the **Export Rules** tab.
For more information about how to navigate to the **Export Rules** tab, see Managing Export Rules, on page 104.

Step 2 Click **Create**.

Step 3 In the **Create Export Rule** dialog box, 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 103.
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

Action	Description
Client Match Spec field	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 option 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 option 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	The index number of the export rule that specifies order of the rule in the export policy.

Step 4 Click **Submit**.

Managing Snapshot Policies

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

Step 2 In the left pane, choose the pod that includes the NetApp C-Mode account and select the NetApp C-Mode account.

Step 3 Click the **SVMs** tab.

Step 4 Click the SVM for which you wish to view details and click **View Details** from the drop-down list on the right pane.

Step 5 Click the **Snapshot Policies** tab.

The snapshot policies available under the account are displayed. The **Snapshot Policies** tab provides the following actions:

Action	Description
Refresh	Refreshes the current page.
Favorite	Adds this page to the **Favorites** tab which displays the page that you go to most often.
Create	Creates a new snapshot policy.

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

Action	Description
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

Step 1 Navigate to the **Snapshot Policies** tab.
For more information about how to navigate to the **Snapshot Policies** tab, see Managing Snapshot Policies, on page 108.

Step 2 Click **Create**.

Step 3 In the **Create Snapshot Policy** dialog box, complete the following fields:

Action	Description
Snapshot Policy Name field	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	The number of snapshots to be retained for the schedule.
Snapmirror label field	The label of the SnapMirror.

Action	Description
Prefix field	The prefix text to be included in the created snapshot names.
Is Enabled check box	Check this check box to enable the policy.

Step 4 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 which initiators LUNs are exported to. The port set limits the target ports on which those initiators have access.

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

Step 2 In the left pane, choose the pod that includes the NetApp C-Mode account and select the NetApp C-Mode account.

Step 3 Click the **SVMs** tab.

Step 4 Click the SVM for which you wish to view details and click **View Details** from the drop-down list on the right pane.

Step 5 Click the **Portsets** tab.
The port sets available under the account are displayed. The **Portsets** tab provides the following actions:

Action	Description
Refresh	Refreshes the current page.
Favorite	Adds this page to the **Favorites** tab which displays the page that you go to most often.
Create	Creates a port set. In the **Create Portset** dialog box, do the following: **1** In the **Portset Name** field, enter the port set name. **2** In the **Portset Type** drop-down list, choose **ISCSI**, **FCP**, or **MIXED** as the port set type. **3** Click **Submit**.

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

Action	Description
Destroy	Deletes a port set after confirmation.
Add Port	Adds a port to a port set. In the **Add Port To Portset** dialog box, click **Select** and choose LIF that needs to be added to the port set.
Remove Port	Removes a port from a port set. In the **Remove Port From Portset** dialog box, 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.

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

Step 2 In the left pane, choose the pod that includes the NetApp C-Mode account and select the NetApp C-Mode account.

Step 3 Click the **SVMs** tab.

Step 4 Click the SVM for which you wish to view details and click **View Details** from the drop-down list on the right pane.

Step 5 Click the **WWPN Aliases** tab.

The WWPN aliases available under the account are displayed. The **WWPN Aliases** tab provides the following actions:

Action	Description
Refresh	Refreshes the current page.
Favorite	Adds this page to the **Favorites** tab which displays the page that you go to most often.

Action	Description
Create	Creates a WWPN Alias. In the **Create WWPN Alias** dialog box, do the following: **1** 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 (.). **2** In the **WWPN** field, enter the FCP initiator WWPN name. For example, 00:00:00:00:00:00:00:00. **3** Click **Submit**.

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

Action	Description
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.

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

Step 2 In the left pane, choose the pod that includes the NetApp C-Mode account and select the NetApp C-Mode account.

Step 3 Click the **FCP Services** tab.
The FCP services created in the account are displayed. The **FCP Services** tab provides the following actions:

Action	Description
Refresh	Refreshes the current page.
Favorite	Adds this page to the **Favorites** tab which displays the page that you go to most often.

Action	Description
Create	Creates a FCP service on SVM.

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

Action	Description
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

Step 1 Navigate to the **FCP Services** tab.
For more information about how to navigate to the **FCP Services** tab, see Managing FCP Services, on page 112.

Step 2 Click **Create**.

Step 3 In the **Create FCP Service** dialog box, complete the following fields:

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

Step 4 Click **Submit**.

Creating and Managing SVM Peers

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

Step 2 In the left pane, choose the pod that includes the NetApp C-Mode account and select the NetApp C-Mode account.

Step 3 Click the **SVM Peer** tab.

The SVM peers that are available under the account are displayed. The **SVM Peer** tab provides the following actions:

Action	Description
Refresh	Refreshes the current page.
Favorite	Adds this page to the Favorites tab which displays the page that you go to most often.
Create	Creates a new SVM peer relationship. To create a new SVM peer relationship, complete the following fields: • **Select Local SVM Name** field—SVM that you want to use as the local SVM. • **Select Peer SVM Name** field—SVM that you want to use as the peer SVM.

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

Button	Description
Delete	Deletes the SVM Peer relationship.
Accept	Accepts the SVM Peer relationship.
Reject	Rejects the SVM Peer relationship.

Creating a Cluster Peer

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

Step 2 In the left pane, choose the pod that includes the NetApp C-Mode account and select the NetApp C-Mode account.

Step 3 Click the **Cluster Peer** tab.

Step 4 Click **Create**.

Step 5 In the **Create Cluster Peer Relationship** dialog box, complete the following fields:

Name	Description
Select Peer Cluster field	Click **Select** and choose the cluster account that you want to use.
Time Out (Seconds) field	The time out value in seconds.

Step 6 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 the SnapMirrors tab. The SnapMirrors tab displays both the Snapmirror and SnapVault data, with the relationship type column differentiating the data.

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

Step 2 In the left pane, choose the pod that includes the NetApp C-Mode account and select the NetApp C-Mode account.

Step 3 Click the **SnapMirrors** tab.
Cisco UCS Director displays all the SnapMirror and SnapVault relationships created in the account. The SnapMirrors tab provides the following actions:

Name	Description
Refresh	Refreshes the current page.
Favorite	Adds this page to the **Favorites** tab.

Name	Description
Create	Creates a new SnapMirror or SnapVault relationship.
Inventory	Runs a SnapMirror or SnapVault inventory.

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

Action	Description
Delete	Deletes the 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	This command performs an incremental transfer.
Resync	Kicks off a resynchronization of a broken SnapMirror or SnapVault pair.
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	This option is available in the drop-down list. The resume command enables future transfers for a SnapMirror or SnapVault relationship that has been quiesced.
Abort	This option is available in the drop-down list. Aborts a SnapMirror or SnapVault transfer before it is complete.

Creating a SnapMirror or SnapVault Relationship

Before You Begin

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

Step 1 Navigate to the **SnapMirrors** tab.
For more information about how to navigate to the **SnapMirrors** tab, see #unique_135.

Step 2 Click **Create**.

Step 3 In the **Create SnapMirror Relationship** dialog box, complete the following fields:

Name	Description
Relationship Type drop-down list	Choose **Data protection** or **Load Sharing** to create a SnapMirror relationship. Choose **SnapVault** to create a SnapVault relationship.
Destination Volume field	Click **Select** and choose the destination volume.
Source Volume field	Click **Select** and choose the source volume.
Policy field	Click **Select** and choose the SnapMirror policies. **Note** The Snapmirror policies are applicable for creating both SnapMirror and SnapVault relationships.
Schedule field	Click **Select** and choose the cron job to schedule the SnapMirror or SnapVault update. **Note** The 5-minute schedule is not applicable for creating a SnapVault relationship, as transfers can be scheduled only at a maximum rate of once every hour.
Maximum Transfer Rate (Kbps) field	The maximum transfer rate. The default value is zero, which means that the MTR is unlimited.

Step 4 Click **Submit**.

Managing SnapMirror Policies

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

Step 2 In the left pane, choose the pod that includes the NetApp C-Mode account.

Step 3 Click the **SnapMirrors Policies** tab.

Cisco UCS Director displays all the SnapMirror policies created in the account. The **SnapMirror Policies** tab provides the following actions:

Name	Description
Refresh	Refreshes the current page.
Favorite	Adds this page to the **Favorites** tab which displays the page that you go to most often.
Create	Creates a new SnapMirror policy.

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

Action	Description
Modify	Updates the restart type and transfer rate of the SnapMirror policy.
Delete	Deletes the SnapMirror policy after confirmation.
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—The snapshot copy retention count. • **SnapMirror Label** field—The snapshot copy label. • **Preserve** checkbox—Check this check box to enable a snapshot copy reservation. • **Warning Threshold Count** field—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

Step 1 Navigate to the **SnapMirror Policies** tab.
For more information about how to navigate to the **SnapMirror Policies** tab, see Managing SnapMirror Policies, on page 118.

Step 2 Click **Create**.

Step 3 In the **Create SnapMirror Policy** dialog box, complete the following fields:

Name	Description
SVM Name field	Click **Select** and choose the SVM name.
Enter Policy Name field	The name of the policy.
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	Comments, if any.

Step 4 Click **Submit**.

Managing Snapshot Policies

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

Step 2 In the left pane, choose the pod that includes the NetApp C-Mode account and select the NetApp C-Mode account.

Step 3 Click the **Snapshot Policies** tab.
The snapshot policies available under the account are displayed. The **Snapshot Policies** tab provides the following actions:

Action	Description
Refresh	Refreshes the current page.
Favorite	Adds this page to the **Favorites** tab which displays the page that you go to most often.
Create	Creates a new snapshot policy.

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

Action	Description
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

Step 1 Navigate to the **Snapshot Policies** tab.
For more information about how to navigate to the **Snapshot Policies** tab, see Managing Snapshot Policies, on page 120.

Step 2 Click **Create**.

Step 3 In the **Create Snapshot Policy** dialog box, complete the following fields:

Action	Description
Snapshot Policy Name field	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	The number of snapshots to be retained for the schedule.
Snapmirror label field	The label of the SnapMirror.
Prefix field	The prefix text to be included in the created snapshot names.
Is Enabled check box	Check this check box to enable the snapshot policy.

Step 4 Click **Submit**.

Managing Jobs

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

Step 2 In the left pane, choose the pod that includes the NetApp C-Mode account and select the NetApp C-Mode account.

Step 3 Click the **Jobs** tab.
The jobs scheduled under the account are displayed. The **Jobs** tab provides the following actions:

Action	Description
Refresh	Refreshes the current page.
Favorite	Adds this page to the **Favorites** tab which displays the page that you go to most often.
Inventory	Runs a job inventory after confirmation.

Managing Cron Job Schedules

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

Step 2 In the left pane, choose the pod that includes the NetApp C-Mode account and select the NetApp C-Mode account.

Step 3 Click the **Cron Job Schedules** tab.
The cron jobs scheduled under the account are displayed. The **Cron Job Schedules** tab provides the following actions:

Action	Description
Refresh	Refreshes the current page.
Favorite	Adds this page to the **Favorites** tab which displays the page that you go to most often.
Create	Creates a cron job schedule.

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

Creating a Cron Job Schedule

Step 1 Navigate to the **Cron Job Schedules** tab.
For more information about how to navigate to the **Cron Job Schedules** tab, see Managing Cron Job Schedules, on page 122.

Step 2 Click **Create**.

Step 3 In the **Create Cron Job Schedule** dialog box, complete the following fields:

Name	Description
Job Schedule Name field	The name of the cron job schedule.
Day of Month field	Values for the cron day of month separated by commas.
Day of Week field	Values for the cron day of week separated by commas.
Hour field	Values for the cron hour separated by commas.
Minute field	Values for the cron minutes separated by commas.
Month field	Values for the cron month separated by commas.

Step 4 Click **Submit**.

Managing NFS Services

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

Step 2 In the left pane, choose the pod that includes the NetApp C-Mode account and select the NetApp C-Mode account.

Step 3 Click the **NFS Services** tab.
The network file system (NFS) services available under the account are displayed. The **NFS Services** tab provides the following actions:

Action	Description
Refresh	Refreshes the current page.
Favorite	Adds this page to the **Favorites** tab which displays the page that you go to most often.
Create	Creates the NFS service.

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

Action	Description
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

Step 1 Navigate to the **NFS Services** tab.

For more information about how to navigate to the **NFS Services** tab, see Managing NFS Services, on page 123.

Step 2 Click **Create**.

Step 3 In the **Create NFS Service** dialog box, complete the following fields:

Name	Description
SVM Name field	Click **Select** and choose the SVM names.
Is NFS Access Enabled check box	Check this check box to enable the NFS access.
Is NFS Vstorage Enabled check box	Check this check box to enable the vStorage for the NFS service.

Step 4 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.

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

Step 2 In the left pane, choose the pod that includes the NetApp C-Mode account and select the NetApp C-Mode account.

Step 3 Click the **System Tasks** tab.
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

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

Step 2 In the left pane, choose the pod that includes the NetApp C-Mode account and select the NetApp C-Mode account.

Step 3 Click the **Routing Group Routes** tab.
The routing group routes set under the account are displayed. The **Routing Group Routes** tab provides the following actions:

Action	Description
Refresh	Refreshes the current page.
Favorite	Adds this page to the **Favorites** tab which displays the page that you go to most often.
Delete	Deletes a routing group route.

Managing Licenses

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

Step 2 In the left pane, choose the pod that includes the NetApp C-Mode account and select the NetApp C-Mode account.

Step 3 Click the **Licenses** tab.
The Licenses available under the account are displayed. The **Licenses** tab provides the following actions:

Action	Description
Refresh	Refreshes the current page.
Favorite	Adds this page to the **Favorites** tab which displays the page that you go to most often.
Add	Adds license to a cluster.

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

Adding a License

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

Step 2 In the left pane, choose the pod that includes the NetApp C-Mode account and select the NetApp C-Mode account.

Step 3 Click the **Licenses** tab.

The licenses available under the account are displayed.

Step 4 Click **Add**.

Step 5 In the **Add License to Cluster** dialog box, enter a license code in the **License Code** field.

Step 6 Click **Submit**.

CHAPTER 7

Monitoring and Reporting for SVM Accounts

This chapter contains the following sections:

About Monitoring and Reporting for SVM Accounts

Cisco UCS Director displays all managed components in each NetApp SVM account.

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 NetApp SVM account:

- Volumes
- Volume LIF Association
- LUNs
- QTrees
- Quotas
- Initiator Groups
- Initiators
- CIFS Shares
- DNS
- IP Hostname
- Export Rules
- Export Policies
- Portsets
- WWPN Aliases

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.

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

Step 2 In the left pane, choose the pod that includes the NetApp SVM account and select the account.

Step 3 Click the **Volumes** tab.
The volumes available in the SVM account are displayed. The **Volumes** tab provides the following actions:

Action	Description
Refresh	Refreshes the current page.
Favorite	Adds this page to the **Favorites** tab which displays the page that you go to most often.
Create	Creates a volume in the NetApp SVM account.

Action	Description
Create Multi-Snapshot	Creates a multi-snapshot for the volume. To create a multi-snapshot, do the following in the **Create Multi-Volume Snapshot** dialog box: **1** In the **Volume Names** field, click **Select** and check the check boxes for the volumes that you want to select. **2** In the **Snapshot Name** field, enter a name for the snapshot. **3** Click **Submit**.

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

Action	Description
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.
Resize	Resizes the volume. To resize the volume, complete the following fields: **1** **Volume Name** field—*Display Only*. The name of the volume. **2** **Current Volume Size**—*Display Only*. The current size of the volume in GB. **3** **New Size** field—The required size of the volume. **4** **Size Units** drop-down list—Choose the size of the volume as **MB**, **GB**, or **TB**.
Clone Volume	Clones the volume. In the **Clone Cluster Volume** dialog box, enter the volume name and choose the parent snapshot.
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 /.

Action	Description
Unmount	Unmounts the volume.
Enable Dedupe	Enables data deduplication on the volume to remove duplicate entries.

Creating a Volume within SVM

Step 1 Navigate to the **Volumes** tab.
For more information about how to navigate to the **Volumes** tab, see the "Managing Volumes" topic.

Step 2 Click **Create**.

Step 3 In the **Create Volume** dialog box, complete the following fields:

Name	Description
Volume Type drop-down list	Choose the type of volume.
Volume Name field	The name of the volume.
Volume Size field	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	The snapshot size as a percentage to be used by the volume.
Export Policy drop-down list	Choose the export policy.
Snapshot Policy field	Click **Select** and choose a snapshot policy for the volume.

Step 4 Click **Submit**.

Managing Volume LIF Association

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

Step 2 In the left pane, choose the pod that includes the NetApp SVM account and select the SVM account.

Step 3 Click the **Volume LIF Association** tab.
The LIFs that are associated with volumes available in the SVM account are displayed. The **Volume LIF Association** tab provides the following actions:

Action	Description
Refresh	Refreshes the current page.
Favorite	Adds this page to the **Favorites** tab which displays the page that you go to most often.

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).

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

Step 2 In the left pane, choose the pod that includes the NetApp SVM account and select the SVM account.

Step 3 Click the **LUNs** tab.
The LUNs available in the SVM are displayed. The **LUNs** tab provides the following actions:

Action	Description
Refresh	Refreshes the current page.
Favorite	Adds this page to the **Favorites** tab which displays the page that you go to most often.
Create	Creates an LUN in the SVM account.

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

Action	Description
Delete	Deletes a LUN. Check the **Force** check box in the **Destroy LUN** dialog box to allow a force deletion of the LUN.
Resize	Resizes the LUN within the volume. To resize the LUN, complete the following fields: 1 **LUN Size** field—The required size of the LUN. 2 **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: 1 **LUN Name** field—*Display Only*. The name of the LUN. 2 **Snapshot Clone** checkbox—Check this check box to clone the LUN from the snapshot. 3 **New LUN Name** field—The new LUN name.
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 the **Initiator Group** drop-down list. Check the **Specify LUN ID** check 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.

Creating a LUN

Step 1 Navigate to the **LUNs** tab.

For more information about how to navigate to the LUNs tab, see Managing LUNs, on page 131.

Step 2 Click **Create**.

Step 3 In the **Create LUN** dialog box, complete the following fields:

Name	Description
Select Volume drop-down list	Choose the volume to which the LUN belongs.
LUN Name field	The name of the LUN.
Size field	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 4 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.

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

Step 2 In the left pane, choose the pod that includes the NetApp SVM account and select the SVM account.

Step 3 Click the **QTrees** tab.

The qtree available in the SVM account are displayed. The **QTrees** tab provides the following actions:

Action	Description
Refresh	Refreshes the current page.
Favorite	Adds this page to the **Favorites** tab which displays the page that you go to most often.
Create	Creates a qtree in the SVM account.

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

Action	Description
Rename	Renames the qtree.

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

Creating a QTree

Step 1 Navigate to the **QTrees** tab.
For more information about how to navigate to the **QTrees** tab, see the "Managing QTrees" topic.

Step 2 Click **Create QTree**.

Step 3 In the **Create QTree** dialog box, do the following:

a) In the **Volume Name** field, click **Select** and choose the volume in which you want to create the qtree.
b) In the **Qtree Name** field, enter the name of the qtree.
c) 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.

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

Step 2 In the left pane, choose the pod that includes the NetApp C-Mode account and select the NetApp C-Mode account.

Step 3 Click the **SVMs** tab.

Step 4 Click the SVM for which you wish to view details and click **View Details** from the purple drop-down list on the right pane.

Step 5 Click the **Quotas** tab.
The quotas available in the SVM account are displayed. The **Quotas** tab provides the following actions:

Action	Description
Refresh	Refreshes the current page.

Action	Description
Favorite	Adds this page to the Favorites tab which displays the page that you go to most often.
Create Quota	Creates a quota for a qtree in the SVM account.

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

Action	Description
Remove Quota	Removes quota of the qtree after confirmation.
Modify Quota	Updates the quota of the qtree.

Creating a Quota

Step 1 Navigate to the **Quotas** tab.
For more information about how to navigate to the **Quotas** tab, see Managing Quotas, on page 95.

Step 2 Click **Create Quota**.

Step 3 In the **Create Quota** dialog box, complete the following fields:

Action	Description
Qtree Name field	Click **Select** and choose a qtree for which the quota needs to be created.
Quota Type drop-down list	Choose **Tree** from the drop-down list.
Disk Space Hard Limit (GB) field	The maximum disk space value in GB.
Files Hard Limit field	The maximum number of files in the quota.
Threshold (GB) field	The threshold limit for the disk space value in GB.
Disk Space Soft Limit (GB) field	The soft quota for the maximum number of files in GB.
Files Soft Limit field	The soft limit for the number of files in the quota.

Managing Initiator Groups

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

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

Step 2 In the left pane, choose the pod that includes the NetApp SVM account and select the SVM account.

Step 3 Click the **Initiator Groups** tab.
The initiator groups available under the account are displayed. The **Initiator Groups** tab provides the following actions:

Action	Description
Refresh	Refreshes the current page.
Favorite	Adds this page to the **Favorites** tab which displays the page that you go to most often.
Create	Creates an initiator group.

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

Action	Description
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

Step 1 Navigate to the **Initiator Groups** tab.

For more information about how to navigate to the **Initiator Groups** tab, see Managing Initiator Groups, on page 136.

Step 2 Click **Create**.

Step 3 In the **Create Initiator Group** dialog box, complete the following fields:

Name	Description
Initiator Group Name field	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 field	Click **Select** and choose a port set from the table.

Step 4 Click **Submit**.

Managing Initiators

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

Step 2 In the left pane, choose the pod that includes the NetApp SVM account and select the SVM account.

Step 3 Click the **Initiators** tab.
The initiators available under the account are displayed. The **Initiators** tab provides the following actions:

Action	Description
Refresh	Refreshes the current page.
Favorite	Adds this page to the **Favorites** tab which displays the page that you go to most often.
Create	Adds an initiator to an initiator group.

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

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

Adding an Initiator

Step 1 Navigate to the **Initiators** tab.
For more information about how to navigate to the **Initiators** tab, see Managing Initiators, on page 137.

Step 2 Click **Create**.

Step 3 In the **Create Initiator** dialog box, complete the following fields:

Name	Description
Initiator Group Name drop-down list	Choose the initiator group under which the initiator to be created.
Initiator Name field	The name of the initiator.
WWPN alias field	Click **Select** and check the check boxes of the WWPN alias for the initiator.
Force check box	Check this check box to forcibly add the initiator.

Step 4 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.

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

Step 2 In the left pane, choose the pod that includes the NetApp SVM account and select the SVM account.

Step 3 Click the **CIFS Shares** tab.
The CIFS shares available in the SVM are displayed. The **CIFS Shares** tab provides the following actions:

Action	Description
Refresh	Refreshes the current page.
Favorite	Adds this page to the **Favorites** tab which displays the page that you go to most often.

Action	Description
Create	Creates a CIFS share in the SVM account.

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

Action	Description
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: 1 **Permission** drop-down list—Choose the level of access permission from the list. 2 **User or Group** field—The user or group name for which the permissions are listed. 3 **Comment** field—Comments, if any.
Delete Share Access	Deletes the CIFS share access.
Modify Share Access	Updates the permission to access the CIFS share.

Creating CIFS Shares

Step 1 Navigate to the **CIFS Share** tab.
For more information about how to navigate to the **CIFS Share** tab, see Managing CIFS Shares, on page 138.

Step 2 Click **Create**.

Step 3 In the **Create CIFS Share** dialog box, 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	The name of the CIFS share.
Comment field	Comments, if any.

Name	Description
Set Share Access check box	Check the check box to provide access to the CIFS share.

Managing DNS

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

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

Step 2 In the left pane, choose the pod that includes the NetApp SVM account and select the SVM account.

Step 3 Click the **DNS** tab.
The DNS configured in the SVM account is displayed. The **DNS** tab provides the following actions:

Action	Description
Refresh	Refreshes the current page.
Favorite	Adds this page to the **Favorites** tab which displays the page that you go to most often.

Managing IP Hostname

You can view the IP address and name of hosts in the SVM account.

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

Step 2 In the left pane, choose the pod that includes the NetApp SVM account and select the SVM account.

Step 3 Click the **IP Hostname** tab.
The SVM name, IP address, and hostname in the SVM account are displayed. The **IP Hostname** tab provides the following actions:

Action	Description
Refresh	Refreshes the current page.
Favorite	Adds this page to the **Favorites** tab which displays the page that you go to most often.

Managing Export Policies

An export policy includes export rules to control client access to volumes. An export policy must exist on a 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 the SVM for individual client access control to each volume.
- Assign the same export policy to multiple volumes of the SVM for identical client access control without having to create a new export policy for each volume.

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

Step 2 In the left pane, choose the pod that includes the NetApp SVM account and select the SVM account.

Step 3 Click the **Export Policies** tab.

The export policies available under the account are displayed. The **Export Policies** tab provides the following actions:

Action	Description
Refresh	Refreshes the current page.
Favorite	Adds this page to the **Favorites** tab which displays the page that you go to most often.
Create	Creates an export policy. In the **Create Export Policy** dialog box, enter the policy name and click **Submit**.

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

Action	Description
Delete	Deletes an export policy after confirmation.
Modify	Updates an export policy.

Managing Export Rules

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

At least one export rule need 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 rule index. The permissions defined in a rule are applied to the clients that match the client match criteria specified in the export rule.

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

Step 2 In the left pane, choose the pod that includes the NetApp SVM account and select the SVM account.

Step 3 Click the **Export Rules** tab.
The export rules available under the account are displayed. The **Export Rules** tab provides the following actions:

Action	Description
Refresh	Refreshes the current page.
Favorite	Adds this page to the **Favorites** tab which displays the page that you go to most often.
Create	Creates an export rule.

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

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

Creating an Export Rule

Step 1 Navigate to the **Export Rules** tab.
For more information about how to navigate to the **Export Rules** tab, see Managing Export Rules, on page 142.

Step 2 Click **Create**.

Step 3 In the **Create Export Rule** dialog box, complete the following fields:

Name	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.
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	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

Name	Description
Read Only Access Rule drop-down list	Choose one of the following option 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.

Name	Description
Read Write Access Rule drop-down list	Choose one of the following option 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	The index number of the export rule that specifies order of the rule in the export policy.

Step 4 Click **Submit**.

Managing Snapshot Policies

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

Step 2 In the left pane, choose the pod that includes the NetApp SVM account and select the SVM account.

Step 3 Click the **Snapshot Policies** tab.
The snapshot policies available under the account are displayed. The **Snapshot Policies** tab provides the following actions:

Action	Description
Refresh	Refreshes the current page.
Favorite	Adds this page to the **Favorites** tab which displays the page that you go to most often.
Create	Creates a new snapshot policy.

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

Action	Description
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

Step 1 Navigate to the **Snapshot Policies** tab.
For more information about how to navigate to the **Snapshot Policies** tab, see Managing Snapshot Policies, on page 145.

Step 2 Click **Create**.

Step 3 In the **Create Snapshot Policy** dialog box, complete the following fields:

Action	Description
Snapshot Policy Name field	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	The number of snapshots to be retained for the schedule.
Snapmirror label field	The label of the SnapMirror.

Action	Description
Prefix field	The prefix text to be included in the created snapshot names.
Is Enabled check box	Check this check box to enable the policy.

Step 4 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 which initiators LUNs are exported to. The port set limits the target ports on which those initiators have access.

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

Step 2 In the left pane, choose the pod that includes the NetApp SVM account and select the SVM account.

Step 3 Click the **Portsets** tab.

The port sets available under the account are displayed. The **Portsets** tab provides the following actions:

Action	Description
Refresh	Refreshes the current page.
Favorite	Adds this page to the **Favorites** tab which displays the page that you go to most often.
Create	Creates a port set. In the **Create Portset** dialog box, do the following: **1** In the **Portset Name** field, enter the port set name. **2** In the **Portset Type** drop-down list, choose **ISCSI**, **FCP**, or **MIXED** as the port set type. **3** Click **Submit**.

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

Action	Description
Destroy	Deletes a port set after confirmation.
Add Port	Adds a port to a port set. In the **Add Port To Portset** dialog box, click **Select** and choose LIF to which the port needs to be assigned.
Remove Port	Removes a port from a port set. In the **Remove Port From Portset** dialog box, 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.

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

Step 2 In the left pane, choose the pod that includes the NetApp SVM account and select the SVM account.

Step 3 Click the **WWPN Aliases** tab.
The WWPN aliases available under the account are displayed. The **WWPN Aliases** tab provides the following actions:

Action	Description
Refresh	Refreshes the current page.
Favorite	Adds this page to the **Favorites** tab which displays the page that you go to most often.

Action	Description
Create	Creates a WWPN Alias. In the **Create WWPN Alias** dialog box, do the following: **1** 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 (.). **2** In the **WWPN** field, enter the FCP initiator WWPN name. For example, 00:00:00:00:00:00:00:00. **3** Click **Submit**.

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

Action	Description
Modify	Updates the WWPN of the alias.
Delete	Deletes the WWPN alias after confirmation.