

VNXe™ Unisphere™ CLI User Guide

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Preface

As part of an effort to improve and enhance the performance and capabilities of its product line, EMC periodically releases revisions of its hardware and software. Therefore, some functions described in this document may not be supported by all versions of the software or hardware currently in use. For the most up-to-date information on product features, refer to your product release notes.

If a product does not function properly or does not function as described in this document, please contact your EMC representative.

Audience

This document is part of the EMC VNXe documentation set, and is intended for EMC service personnel and/or advanced users who have experience working with a command line interface (CLI).

Audience should be familiar with the following topics:

- ◆ *Using a CLI*
- ◆ *Storage provisioning and management*
- ◆ *Network management and security*
- ◆ *Data protection*

Related documentation

Related documents include:

- ◆ *EMC Unisphere online help*
- ◆ *Using an EMC VNXe System with Generic iSCSI Storage*
- ◆ *Using an EMC VNXe System with CIFS Shared Folders*
- ◆ *Using an EMC VNXe System with NFS Shared Folders*
- ◆ *Using an EMC VNXe system with NFS Datastores*
- ◆ *Using an EMC VNXe system with VMFS Datastores*

Conventions used in this document

EMC uses the following conventions for special notices.

Note: A note presents information that is important, but not hazard-related.



CAUTION

A caution contains information essential to avoid data loss or damage to the system or equipment.



IMPORTANT

An important notice contains information essential to operation of the software.

Typographical conventions

EMC uses the following type style conventions in this document:

Normal	Used in running (nonprocedural) text for: <ul style="list-style-type: none"> Names of interface elements (such as names of windows, dialog boxes, buttons, fields, and menus) Names of resources, attributes, pools, Boolean expressions, buttons, DQL statements, keywords, clauses, environment variables, functions, utilities URLs, pathnames, filenames, directory names, computer names, filenames, links, groups, service keys, filesystems, notifications
Bold	Used in running (nonprocedural) text for: <ul style="list-style-type: none"> Names of commands, daemons, options, programs, processes, services, applications, utilities, kernels, notifications, system calls, man pages <p>Used in procedures for:</p> <ul style="list-style-type: none"> Names of interface elements (such as names of windows, dialog boxes, buttons, fields, and menus) What user specifically selects, clicks, presses, or types
<i>Italic</i>	Used in all text (including procedures) for: <ul style="list-style-type: none"> Full titles of publications referenced in text Emphasis (for example a new term) Variables
<code>Courier</code>	Used for: <ul style="list-style-type: none"> System output, such as an error message or script URLs, complete paths, filenames, prompts, and syntax when shown outside of running text
Courier bold	Used for user input (such as commands)
<i>Courier italic</i>	Used in procedures for: <ul style="list-style-type: none"> Variables on command line User input variables
< >	Angle brackets enclose parameter or variable values supplied by the user
[]	Square brackets enclose optional values
	Vertical bar indicates alternate selections - the bar means "or"
{ }	Braces indicate content that you must specify (that is, x or y or z)
...	Ellipses indicate nonessential information omitted from the example
""	Double quotes enclose values that contain spaces or special characters, such as commas, new lines, double quotes, or periods.

Where to get help

EMC support, product, and licensing information can be obtained as follows:

Product information: For documentation, release notes, software updates, or for information about EMC products, licensing, and service, go to the EMC Online Support website (registration required) at:

<http://www.emc.com/vnxesupport/>

Technical support: For technical support, go to the EMC Online Support website. To open a service request, you must have a valid support agreement. Please contact your EMC sales representative for details about obtaining a valid support agreement or to answer any questions about your account.

Your comments

Your suggestions will help to improve the accuracy, organization, and overall quality of the user publications. Please send your opinion of this document to:

`techpub_comments@EMC.com`

1

Introduction

This chapter addresses the following topics:

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Overview

Unisphere CLI enables you to run commands on a system through a prompt from a Microsoft Windows or UNIX/Linux host. Use EMC® Unisphere™ for managing a system. Unisphere CLI is intended for advanced users who want to use commands in scripts for automating routine tasks.

Use Unisphere CLI to manage a system. Tasks include:

- ◆ Configuring and monitoring the system.
- ◆ Managing users.
- ◆ Provisioning storage.
- ◆ Protecting data.
- ◆ Controlling host access to storage.

Storage types

Unisphere CLI supports provisioning and management of network block and file-based storage, including:

- ◆ Shared folder storage, which contains one or more shares. Allows clients to store data and easily access shared folders and shares that integrate seamlessly into:
 - Windows environments that use the CIFS protocol for file sharing, Microsoft Active Directory for authentication, and Windows directory access for folder permissions.
 - Linux/UNIX environments that use the NFS protocol for file sharing and POSIX access control lists for folder permissions.
- ◆ Generic iSCSI storage, which contains one or more virtual disks. Provides generic block-level storage to hosts and applications that use the iSCSI protocol to access storage in the form of virtual disks.
- ◆ Storage for VMware virtual machines through datastores that are accessible through either the NFS protocol or VMFS (over iSCSI) protocol. Install Service Pack 3 (SP3) or higher of the system management software to use this functionality.

Use Unisphere CLI in scripts

Use scripts with Unisphere CLI to automate routine tasks, such as provisioning storage or scheduling snapshots to protect stored data. For example, create a script to create a snapshot of an iSCSI virtual disk and delete the older snapshots created before it. EMC Customer Service does not provide sample scripts or support for custom scripting.

Set up the Unisphere CLI client

You can install and launch the Unisphere CLI client on a Microsoft Windows or UNIX/Linux computer. Unisphere CLI sends commands to the system through the secure HTTPS protocol.

Install the Unisphere CLI client

To install the Unisphere CLI client:

1. Go to the EMC Online Support website.
2. Download the Unisphere CLI client for your operating system.
3. Perform the following based on your operating system:
 - On Windows, double-click the installer executable and follow the prompts. The default installation location is:

`C:\Program Files\EMC\Unisphere CLI`

Note: The installation directory is added to the PATH system variable.

- On UNIX/Linux, type:
`rpm -ihv <filename>`,
where *filename* is the name of the installer executable. The default installation location is:
`/opt/emc/uemcli-<version>/bin/`,
where *version* is the version of the client installed.

Launch the Unisphere CLI client

After installing the Unisphere CLI client, you can launch the client on a Microsoft Windows or UNIX/Linux computer.

To launch the Unisphere CLI client, perform the following in a command prompt based on your operating system:

- ♦ On Windows, type:
`uemcli.exe`
- ♦ On UNIX/Linux, type:
`/usr/bin/uemcli`

Unisphere CLI syntax

Following is the syntax of an example command line:

```
uemcli [<switches>] <object path> [<object qualifier>] <action> [<action  
qualifiers>]
```

[Typographical conventions on page 10](#) explains the typographical conventions used in this document.

Executable

All command lines begin with the executable **uemcli**. If you do not start each command line with **uemcli**, the command fails and you must rerun the command. If you run only **uemcli**, without any switches or commands, the list of switches and their descriptions appears.

Switches

Use local switches to configure Unisphere CLI and connect to a system. Type switches immediately after **uemcli**. When typing more than one switch on the same line, separate each switch with a space. All switches start with a hyphen (-).

[Chapter 2, Use Switches](#) provides details on all available switches.

Objects

Objects identify the type of object on which to perform an action, such as a user, host, LDAP setting, or the system you are managing. All objects are categorized into types and are nested, as parent/child, to form a path to the actual object on which to perform an action, similar to locating a file in a filesystem. An object type can be a parent or a child of a parent. Not all parent object types contain child objects. For example, the deduplication object type does not contain children objects.

All actions require the fully qualified path to the object. The one exception is the **-help** switch, which applies to an object at any level in a path. [Get help on page 20](#) explains how to use the **-help** switch.

The actual object on which you perform an action is identified by an ID called an object qualifier, as explained in [Object qualifiers on page 16](#).

Example 1

In the following example for creating a user account, the two object types are **user** and **account**:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /user/account create -name  
user1 -type local -passwd Password789! -role operator
```

Example 2

In the following example for viewing all user accounts on the system, the object types are **user** and **account**. An object ID is not specified, so the show action is performed on **account**, which displays a list of all user accounts:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /user/account show
```

Object qualifiers

Object qualifiers are unique identifiers for objects on the system. The format is:

```
-<identifier> <value>
```

where:

- ◆ *identifier* — Type of object qualifier. The most common is **-id**.
- ◆ *value* — Actual object qualifier.

When you create an object, such as a user or network interface, it receives an ID, which is the object qualifier for that object. When performing actions such as viewing, changing, or deleting an object, you specify its object qualifier. The most common identifier is the **-id** parameter. The uniqueness of the qualifier is only guaranteed in the scope of the specified object type. All object qualifiers start with a hyphen (-).

Example

In the following example for changing the password of a user account, the object qualifier is **local_user**:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /user/account -id local_user
set -passwd NewPassword456! -oldpasswd password123
```

Actions

Actions are the operations performed on an object or object type, including creating, changing, viewing, and deleting. Actions are always required. [Action commands on page 18](#) provides details on each of the action commands.

Example

In the following example for changing the password of a user account, the action is **set**:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /user/account -id local_user
set -passwd NewPassword456! -oldpasswd password123
```

Action qualifiers

Action qualifiers are parameters specific to actions, such as attributes or settings to modify when changing an object. All action qualifiers start with a hyphen (-).

Example

In the following example for changing a role and password for a user account, the action qualifiers are **-passwd**, **-oldpasswd**, and **-role**:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /user/account -id local_user
set -passwd newpassword -oldpasswd password123 -role administrator
```

Size qualifiers

Use size qualifiers to indicate a specific capacity-size value. To specify a fraction, use a period. For example, type 2.4T for 2.4 terabytes. The output for a size value displays the exact number of bytes and the specified size value:

```
Size = 1209462790557 (1.1TB)
```

[Table 1 on page 17](#) lists the size qualifiers. The qualifiers are case-sensitive.

Table 1 Size qualifiers

Qualifier	Measurement
K	Kilobyte
M	Megabyte
G	Gigabyte
T	Terabyte
P	Petabyte

Action commands

When using Unisphere CLI, there are four primary action commands that you can perform on object types or objects, including creating, changing, viewing, and deleting. This section explains each of these four action commands. [Unisphere CLI syntax on page 16](#) explains the relationship between action commands, object types, and objects.

The create action command

The **create** action command creates an object on the system based on the specified path to the object. If the command is successful, the new object receives an object qualifier, or ID, that identifies the object on the system.

Format

```
<object> create [<action qualifiers>]
```

Example

The following example uses the **create** action command to create a local user account. The new user account receives the ID Local_user/user1:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /user/account create -name  
user1 -type local -passwd Password789! -role operator
```

```
ID = Local_user/user1  
Operation completed successfully.
```

The set action command

The **set** action command modifies, or changes, an object type or object based on the specified path and object qualifier. If the object identified by the object qualifier does not exist, an error message appears.

Format

```
<object path> set <object qualifier> [<action qualifiers>]
```

Example

The following example uses the **set** action command to change the password for a user account. The path /user/account specifies that the object type is a user account. The **-id** object qualifier identifies local_user as the user account to change:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /user/account -id local_user  
set -passwd NewPassword456! -oldpasswd OldPassword456!
```

```
ID = local_user  
Operation completed successfully.
```

The show action command

The **show** action command displays a list of objects that exist on the system and the attributes of those objects. You can specify an object qualifier to view the attributes for a single object. The **show** action command provides qualifiers for changing the display of the output, including the format and the attributes to include. The available output formats are name-value pair (NVP), table, and comma-separated values (CSV).

Format

```
<object path> [<object qualifier>] show [-output {nvp|table[-wrap]|csv}]  
[{-brief|-detail}]
```

Action qualifiers

Qualifier	Description
-output -o	Specify the output format. Value is one of the following: <ul style="list-style-type: none"> nvp — The name-value pair (NVP) format displays output as name=value. Name-value pair format on page 19 provides an example of the NVP format. table — The table format displays output as a table, with column headers and rows. By default, values that are too long to fit in a column are cut off. Add -wrap after the table qualifier, separated by a space, so that the values wrap. Table format on page 19 provides an example of the table format. csv — The comma-separated values (CSV) format is similar to the table format, but the names and values are separated by commas. Comma-separated values format on page 19 provides an example of the CSV format.
-detail	Display all attributes.
-brief	Display only the basic attributes (default).

Name-value pair format

```

1:      ID              = 1a0_SPA
        SP              = SPA
        Ports           = eth0_SPA,eth1_SPA
        Health state    = OK (5)
        Operational status = OK (0x2)

2:      ID              = 1a0_SPB
        SP              = SPB
        Ports           = eth0_SPB,eth1_SPB
        Health state    = OK (5)
        Operational status = OK (0x2)

```

Table format

ID	SP	Ports	Health state	Operational status
1a0_SPA	SPA	eth0_SPA,eth1_SPA	OK (5)	OK (0x2)
1a0_SPB	SPB	eth0_SPB,eth1_SPB	OK (5)	OK (0x2)

Comma-separated values format

```

ID,SP,Ports,Health state,Operational status
1a0_SPA,SPA,"eth0_SPA,eth1_SPA",OK (5),OK (0x2)
1a0_SPB,SPB,"eth0_SPB,eth1_SPB",OK (5),OK (0x2)

```

The delete action command

The **delete** action command removes an object from the system based on the specified object and object qualifier.

Format

```
<object path> <object qualifier> delete
```

Example

The following command deletes user account local_user1:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /user/account -id
local_user1 delete
```

Get help

For help with using the CLI, use the **-help**, **-h**, or **-?** switch for information about the syntax, an object type, or a specific object or action command.

Help on the Unisphere CLI client

For help on the client, including the use cases, switches, and system requests, type only **uemcli** or include the **-help|-?** switch. [View the switches on page 24](#) provides details on all available switches.

Example

The following command displays information about the syntax and switches:

uemcli -?

[Get help on client options]

```
uemcli -help
{CMDHELP|CMD|upload|download|version|saveUser|removeUser|removeAllUsers|
default|certList|certClear|certDel|certImport}
```

[Get help on objects or actions]

```
uemcli [-d <address>] [-port <number>] [-u <user_name>] [-p <password>]
[-sslPolicy {interactive|reject|accept|store}] [-t <seconds>] [-silent]
[-noHeader] [-cmdTime] <object> [<action>] -help
```

[Perform an action on an object on the destination system]

```
uemcli [-d <address>] [-port <number>] [-u <user_name>] [-p <password>]
[-sslPolicy {interactive|reject|accept|store}] [-s <name>[:<version>]]
[-gmtoff [-|+]<HH>[:<MM>]] [-t <seconds>] [-silent] [-noHeader] [-cmdTime]
<object> [<qualifiers>] <action> [<qualifiers>]
```

[Upload a file to the destination system]

```
uemcli [-d <address>] [-port <number>] [-u <user_name>] [-p <password>]
[-sslPolicy {interactive|reject|accept|store}] [-t <seconds>] [-silent]
[-noHeader] -upload -f <file_path> <type> [-<parameter> <value> ...]
<action>]
```

[Download a file from the destination system]

```
uemcli [-d <address>] [-port <number>] [-u <user_name>] [-p <password>]
[-sslPolicy {interactive|reject|accept|store}] [-t <seconds>] [-silent] [
noHeader] -download {-d <directory>|-f <file_path>} <type> [-<parameter>
<value> ...] [<action>]
```

[Display the version of this client]

```
uemcli -version
```

[Save access credentials for the destination system locally]

```
uemcli [-d <address>] [-port <number>] -u <user_name> -p <password> [-silent]
-saveUser
```

[Remove access credentials for the destination system from this client]

```
uemcli [-d <address>] [-port <number>] [-silent] -removeUser
```

[Remove all stored access credentials from this client]

```
uemcli [-silent] -removeAllUsers
```

[Save the destination address as the default for this client]

```
uemcli -d <address> -port <number> [-silent] -default
```

```
[List certificates saved for this client]
uemcli [-silent] -certList

[Delete a certificate from this client]
uemcli [-silent] -certDel <certificate_id>

[Delete all certificates from this client]
uemcli [-silent] -certClear

[Import an SSL certificate from a file]
uemcli [-silent] -certImport <file>
```

Help on parent object types

For help on parent objects types, which typically contain child object types, type the object type followed by the **-help** switch to view the object types it contains.

Example

The following command displays a list of DNS object types: **/net** is the parent object type and **/dns** is the child object type. In the output, the items in brackets are the objects on which you perform actions, such as creating and changing.

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /net/dns -help

+- /net/dns/
    +- [config]
    +- [domain]
```

Note: To get help on all object types, type only a forward slash (/). For example, / -help.

Help on child object types

For help on child object types, which are children of parent object types, type the object type followed by the **-help** switch to view a list of supported action commands.

Example

The following command displays the action commands to set (change) and show a DNS server setting: **/net** is the parent object type and **/dns** and **/config** are the child object types. In the output, the items in brackets are the actions, such as creating and changing, you can perform on the specified object types:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /net/dns/config -?
```

Configure system DNS client settings.

Actions:

```
[Set]
/net/dns/config set -nameServer <value>
```

```
[Show]
/net/dns/config show [-output {nvp|csv|table[-wrap]]] [{-brief|-detail}]
```

Help on actions

For help on an action command, type the fully qualified object parameter and action command, followed by the **-help** action qualifier.

Example

The following command displays the list of interface attributes that you can change:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /net/if set -?
```

```
/net/if -id <value> set [-vlanId <value>] [-ipv4 static [-addr  
    <value>][-netmask <value>][-gateway <value>]]
```

Where:

-id <value>

Type the ID of the interface to change.

[Optional] -vlanId <value>

Type the virtual LAN (VLAN) ID for the interface. The interface uses the ID to accept packets that have VLAN tags. The value range is 0 to 4096. If the VLAN ID is 0, the default, packets do not have VLAN tags.

[Optional] -ipv4 static [-addr <value>][-netmask <value>] [-gateway
<value>]

Specify to type the (IPv4) configuration information for the interface.

static

Type the value 'static', without quotes, to specify that you will type the configuration information.

[Optional] -addr <value>

Type the IP address for the interface.

[Optional] -netmask <value>

Type the subnet mask for the interface.

[Optional] -gateway <value>

Type the gateway for the interface.

2

Use Switches

This chapter addresses the following topics:

View the switches	24
Access the system	26
Upload an upgrade candidate	27
Hide header information.....	28
Manage SSL certificates.....	28
Save Unisphere CLI settings.....	30

View the switches

The Unisphere CLI switches apply only to your installed Unisphere CLI client. Use the switches to access a system, upload files to the system, and manage security certificates.

Format

```
uemcli [{-help|-h|-?}]
```

Table 2 on page 24 describes each of the switches.

Table 2 Switches

Switch	Description
-destination -d	IP address or network name of the destination system. If you do not include this switch, the client uses the addresses specified for -default . If no default address exists, the client uses the localhost address 127.0.0.1.
-port	Port number on the system.
-user -u	Username for logging in to the system.
-password -p	Password for logging in to the system.
-timeout -t	Timeout (in seconds) after which you are automatically logged out of the system due to user inactivity or a system problem. The default value is 600 seconds (10 minutes).
-sslPolicy	Policy for handling unknown SSL certificates downloaded from the system. Value is one of the following: <ul style="list-style-type: none"> interactive — Prompt the user to accept the certificates for the current session (default). reject — Automatically reject the certificates. accept — Automatically accept the certificates. store — Automatically accept and store the certificates.
-certList	List of all certificates stored locally in the lockbox.
-certClear	Delete all certificates stored locally in the lockbox.
-certDel	Delete one or more certificates from the lockbox. Type a comma-separated list of certificate IDs. Note: Use -certlist to view a list of stored certificates with their IDs.
-certImport	Import a certificate from a file. Supported formats are: <ul style="list-style-type: none"> Privacy Enhanced Mail (PEM) Distinguished Encoding Rules (DER) Cryptographic Message Syntax (PKCS #7)
-syntax -s	Syntax name and version (optional) to use in the client. Separate the name and version with a colon. For example, the following switch applies the UEM version 1.5 syntax: -syntax uem:1.5

Table 2 Switches (continued)

Switch	Description
-upload	<p>Upload a file to the system. Type the file type and location in the following format: <code>{-help <type> -help -f -file} <file> <type> [<parameter>=<value>...]}</code> where:</p> <ul style="list-style-type: none"> -help — Display a list of file types you can upload to the system. type -help — Display information about a file type. Value is one of the following: <ul style="list-style-type: none"> license — A license file. During upload the license is installed on the system. upgrade — A system software upgrade candidate file. When you upload an upgrade candidate file onto your system, it replaces the previous version. There can be only one upgrade candidate on the system at a time. Upgrade the system software on page 46 explains upgrading the system software using an uploaded upgrade candidate. certificate — An Lightweight Directory Access Protocol (LDAP) certificate file. During upload the certificate is installed on the system. -f -file file type — For file, type the path and filename of the file to upload. For type, type the file type to upload. parameter=value — Optional parameter=value pairs for including specific parameters during the upload. <p>Note: For a list of supported file types, type -upload -help</p>
-gmtoff	<p>Greenwich Mean Time (GMT) offset for converting the time on the system to the time on the client system. Type auto to send the offset of the current client system. Type the following to specify the offset: <code>[- +] <HH> [: <MM>]</code> where:</p> <ul style="list-style-type: none"> - + — Type the sign of the GMT offset. If the offset is ahead of GMT, you can omit the plus sign. HH — Type the hours for the offset. MM — Type the minutes for the offset (optional). Separate the minutes from the hours with a colon.
-help -h -?	Display information about the syntax and switches.
-saveUser	Save the access credentials specified for the -user and -password switches to a local security file in the lockbox. With the access credentials saved, Unisphere CLI automatically applies them to the specified system destination and port pair each time you run a command. Save Unisphere CLI settings on page 30 explains saving user account credentials to the local client system.
-removeUser	Remove the specified user account from the lockbox.
-default	<p>Save the destination and port pair as the default system to access. When you run a command, Unisphere CLI will run the command on the default system.</p> <p>Unisphere CLI saves the specified destination and port pair to a local security file in the lockbox. Each time you include the -default switch, Unisphere CLI overwrites the previous saved destination and port pair with the current destination and port pair.</p> <p>If you include the -port switch, the specified port value is paired with the -destination value and saved to the local security file. Save Unisphere CLI settings on page 30 explains saving user account credentials to the local client system.</p>
-silent	Allow a command to complete by suppressing the output and not requiring user confirmation. This is useful when there are commands in scripts.
-noHeader	Hide the header message (system IP address, port number, and so on) that appears above the command output. Hide header information on page 28 explains how to hide the header from the output.
-v -version	Display the version of your Unisphere CLI.
-cmdTime	Display the current time on the destination system.

Access the system

To access and run commands on a system through Unisphere CLI, specify the network name or management IP address of the system, your username, and your password.

IMPORTANT

Unisphere CLI does not provide a session mode in which you log in to the system once and run commands. You must type the destination system, your username, and your password each time you run a command. Doing so logs in to the system, runs the command, and then logs out. To avoid having to type the access credentials each time you run a command, include the **-saveUser** switch to save the username and password for the specified destination system and port pair.

Format

```
[{-d|-destination} <value>] [{-u|-user} <user_name>] [{-p|-password} <password>]
```

Switches

Switch	Description
-destination -d	IP address or network name of the destination system. If you do not include this switch, the client uses the addresses specified for -default . If no default address exists, the client uses the localhost address 127.0.0.1.
-user -u	Domain and username for logging in to the system. For example, Local/joe.
-password -p	Password for logging in to the system.
-port	Specify the port number through which to access the system. If you do not include the -port switch, Unisphere CLI accesses the system through default port 443.
-default	Save the destination and port pair as the default system to access. When you run a command, Unisphere CLI runs the command on the default system. Unisphere CLI saves the specified system and port pair to a local file. Each time you include the -default switch, Unisphere CLI overwrites the previously saved destination and port pair with the current destination and port pair. If you include the -port switch, the specified port value is paired with the -destination value and saved to the local file. Hide header information on page 28 explains saving user account credentials on the local client system.
-saveUser	Save the access credentials specified for the -user and -password switches to a local file. With the access credentials saved, Unisphere CLI automatically applies them to the specified destination and port pair each time you run a command. Hide header information on page 28 explains saving user account credentials on the local client system.
-removeUser	Remove saved access credentials for the specified destination and port pair.

Example 1

The following example accesses the destination system 10.0.0.1 as user Local/joe with password 12345:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456!
```

Example 2

The following example saves the access credentials for the specified user:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! -saveUser
```

Example 3

The following example sets the destination system as the default:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! -default
```

Example 4

The following example accesses the default system:

```
uemcli -u Local/joe -p MyPassword456!
```

Example 5

The following example removes the saved access credentials of user Local/joe and password 12345 from destination system 10.0.0.1:

```
uemcli -d 10.0.0.1 -removeUser
```

Upload an upgrade candidate

To upgrade the system software, upload an upgrade candidate file that you download from the EMC Online Support website and use the **-upload**. Once you upload the candidate file to the system, use an upgrade session to start the upgrade process. [Create upgrade sessions on page 46](#) explains configuring upgrade sessions.

Prerequisite

Download the latest system software upgrade candidate from the EMC Online Support website.

Format

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! -upload -f <file> upgrade
```

Option

Option	Description
-f	Type the path and filename of the upgrade candidate file to upload. Wrap the path and file name in quotes.

Example

The following example upload a upgrade candidate file to the system:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! -upload -f
  "\\upgrade_image\upgrade-2.0.0.12190-MAGNUM-RETAIL.tgz.bin" upgrade
```

Operation completed successfully.

Hide header information

Each time you run a switch or command, the header message appears. The header displays the destination system, system port number, the syntax, and communication protocol used (HTTPS). For example:

```
Storage system address: 127.0.0.1
Storage system port: 443
HTTPS connection
```

To hide the header, include the **-noHeader** switch:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! -noHeader /sys/general show
```

```
1:      System name           = Vorpai
      Model                   = SENTRY DUAL SP 12GB RAM WM PHTM
      Platform type          = Sentry_DualSP
      Product serial number  = FNM00102000154
      Auto failback          = on
      Health state           = Degraded/Warning (10)
```

Manage SSL certificates

When logging in to the system through Unisphere CLI, the system uses Secure Socket Layer (SSL) certificates to secure communications between the CLI client and the system. You can manage these certificates and configure a policy for the Unisphere CLI to use when receiving unknown certificates. All downloaded certificates are stored in the secure, local lockbox on the client system. [Save Unisphere CLI settings on page 30](#) explains how settings are saved.

Configure a certificate policy

Set up a certificate policy to specify how Unisphere CLI will automatically respond to unknown SSL certificates downloaded from the system.

Format

```
-sslPolicy <value>
```

Switch

Switch	Description
-sslPolicy	Value is one of the following: <ul style="list-style-type: none"> interactive — Client prompts the user to take action (default). reject — Client automatically rejects the certificates. accept — Client automatically accepts the certificates. store — Client automatically accepts and stores the certificates in the lockbox.

View certificates

View a list of all SSL certificates stored in the lockbox.

Note: [The show action command on page 18](#) explains how to change the output format.

Format

```
-certList
```

Delete certificates

Delete one or more SSL certificates from the lockbox.

Format

`-certList <certificate IDs>`

Switch

Switch	Description
-certList	Type a comma-separated list of certificate IDs to delete. Note: Use -certList to view a list of stored certificates with their IDs.

Clear all certificates

Delete all SSL certificates from the lockbox.

Format

`-certClear`

Import certificates

Import a SSL certificate from a file.

Format

`-certImport <file>`

Switch

Switch	Description
-certImport	Type the path and name for the file to import. Supported formats are: <ul style="list-style-type: none">• Privacy Enhanced Mail (PEM)• Distinguished Encoding Rules (DER)• Cryptographic Message Syntax (PKCS #7)

Save Unisphere CLI settings

You can save the following settings on the host on which you run Unisphere CLI:

- ◆ User access credentials, including your username and password, for each system you access.
- ◆ SSL certificates imported from the system.
- ◆ Information about default system to access through Unisphere CLI, including the system name or IP address and the system port number.

Unisphere CLI saves the settings to a secure lockbox that resides locally on the host on which Unisphere CLI is installed. The stored data is only available on the host where it was saved and to the user who saved it. The lockbox resides in the following locations:

- ◆ On Windows:

`C:\Documents and Settings\<account_name>\Local Settings\Application Data\EMC\UEM CLI\`

- ◆ On UNIX/Linux:

`<home_directory>/EMC/UEM CLI`

Locate the files `config.xml` and `config.key`. If you uninstall Unisphere CLI, these directories and files are not deleted, giving you the option of retaining them. However, for security reasons, you may want to delete these files.

3

Manage the System

This chapter addresses the following topics:

Configure general system settings	32
Manage users	35
View installed feature licenses	40
View and accept the End User License Agreement	41
Manage remote logging	42
View system software versions	45
Upgrade the system software	46
Manage snapshot protection schedules	48
Manage task rules	50

Configure general system settings

Configure general settings on the system, including:

- ◆ Enable or disable automatic failback for SP.
- ◆ Manually fail back storage servers (Shared Folder Servers and iSCSI nodes).
- ◆ Perform a check of the overall system health.

Note: Failover occurs when there is a hardware or software problem with an SP. This failover causes all storage servers that run on it to fail over to the another SP with minimal disruption to connected hosts. Once the SP is fixed, and automatic failover is enabled, all storage servers automatically fail back to their original SP.

Table 3 on page 32 lists the general system attributes.

Table 3 General system attributes

Attribute	Description
System name	Name of the system.
Model	System model.
Platform type	Hardware platform of the system.
Product serial number	System serial number.
Auto failback	Indication of whether auto failback is enabled for the SP. Value is on or off.
Health state	<p>Health state of the system. The health state code appears in parentheses. Value is one of the following:</p> <ul style="list-style-type: none"> • Unknown (0) — Status is unknown. • OK (05) — Working correctly. • OK BUT (7) — Working correctly, but there could be a problem. • Degraded/Warning (10) — Working and performing all functions, but the performance may not be optimum. • Minor failure (15) — Working and performing all functions but overall performance is degraded. This condition has a minor impact on the system and should be remedied at some point, but does not have to be fixed immediately. • Major failure (20) — Failing and some or all functions may be degraded or not working. This condition has a significant impact on the system and should be remedied immediately. • Critical failure (25) — Failed and recovery may not be possible. This condition has resulted in data loss and should be remedied immediately. • Non-recoverable error (30) — Completely failed and cannot be recovered.

View system settings

View the current system settings.

Note: The [show action command](#) on page 18 explains how to change the output format.

Format

```
/sys/general show
```

Example

The following command displays the general settings for the system:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /sys/general show
```



```

1:      System name           = Vorpai
      Model                   = SENTRY DUAL SP 12GB RAM WM PHTM
      Platform type          = Sentry_DualSP
      Product serial number   = FNM00102000154
      Auto failback           = on
      Health state            = Degraded/Warning (10)

```

Change general system settings

Change the name of the system, or whether automatic failback is enabled or disabled.

Format

```
/sys/general set [-name <value>] [-autoFailback {on|off}]
```

Action qualifiers

Qualifier	Description
-name	Type a name for the system.
-autoFailback	Enable or disable automatic failback. Value is on or off.

Example

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /sys/general set
      -autoFailback off
```

Operation completed successfully.

Manually fail back storage servers

Manually fail back all failed over storage servers (Shared Folder Servers and iSCSI nodes) to their original SP. If auto failback is enabled, failback occurs automatically. [Change general system settings on page 33](#) provides the commands for enabling automatic failback.

Format

```
/sys/general failback
```

Example

The following command fails back all storage servers that have failed over:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /sys/general failback
```

Operation completed successfully.

Perform a system health check

Perform a health check of the entire system. A health check is a series of checks on the state of your system to ensure that no underlying problems exist.

Note: Before upgrading the system software, a system health check must be performed. All system components must be healthy prior to upgrading the system software. If any of the system components are degraded, the software update will fail.

Format

```
/sys/general healthcheck
```

Example

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /sys/general healthcheck
```

```
Operation completed successfully.
```

Manage users

Control user access to the system and functionality by creating user accounts for each manager or administrator who needs to configure and monitor the system. The accounts combine a unique username and password with a specific role for each identity. The specified role determines the types of actions that the user can perform after logging in. When users connect to the system through Unisphere CLI or Unisphere, the system prompts them to type their username and password to gain access.

Table 4 on page 35 lists the attributes for user roles

Table 4 User role attributes

Attribute	Description
Name	<p>Name of the user role. Value is one of the following:</p> <ul style="list-style-type: none"> administrator — Administrator role: Can view system data, edit system settings, and perform all major administrator tasks. storageadmin — Storage administrator role: Can view system data, edit settings, and create and delete storage and hosts. Cannot add user accounts or host configurations, perform initial system configuration, modify network settings, create or delete storage servers, or upgrade system software. operator — Operator role: Can view system and storage status information but cannot change system settings. This role provides view-only permissions.
Description	Brief description of the user role.

View user roles

View a list of roles to which you can assign users. You can filter on the role name.

Note: The [show action command on page 18](#) explains how to change the output format.

Format

```
/user/role [-name <value>] show
```

Object qualifier

Qualifier	Description
-name	<p>Type the name of the user role. Value is one of the following:</p> <ul style="list-style-type: none"> administrator — Administrator role storageadmin — Storage Administrator role operator — Operator role (view only) <p>Note: Values are case-sensitive.</p>

Example

The following command displays a list of user roles on the system:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /user/role show
```

```
1:      Name           = administrator
      Description = User is allowed to perform security tasks.
```

- ```

2: Name = storageadmin
 Description = User has access to all administrative and management
 interfaces and data.

3: Name = operator
 Description = User is allowed to see all storage system data but not to
 perform any storage management operations.

```

## Create user accounts

Create an account for a user or user group and assign the account to a role. The role specifies the user permissions. Users can be local to the system or authenticated by using LDAP. User groups are only authenticated using LDAP.

Each user account is identified by an ID.

### Format

```

/user/account create -name <value> -type {local -passwd
<value>|ldapuser|ldapgroup} -role <name>

```

### Action qualifiers

| Qualifier | Description                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|-----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| -name     | Type a name for the account. For LDAP users and groups that are required to indicate the domain, use the following format:<br><code>&lt;domain&gt;/&lt;name&gt;</code><br>where:<br><ul style="list-style-type: none"> <li><i>domain</i> — LDAP domain.</li> <li><i>name</i> — Account name.</li> </ul>                                                                                                                                             |
| -type     | Type the type of user or user group. Value is one of the following:<br><ul style="list-style-type: none"> <li>local — Local user.</li> <li>ldapuser — User has an LDAP account.</li> <li>ldapgroup — Group has an LDAP account.</li> </ul>                                                                                                                                                                                                          |
| -passwd   | For local users, type the user password.<br>The following are the password requirements for user accounts:<br><ul style="list-style-type: none"> <li>Passwords must be 8 to 40 characters in length and cannot contain spaces.</li> <li>Passwords must include mixed case, a number, and a special character from this list:<br/> <code>!,@#\$%^*?_~</code></li> <li>When changing a password, do not reuse any of the last 3 passwords.</li> </ul> |
| -role     | Type the name of the role for the account. Value is one of the following:<br><ul style="list-style-type: none"> <li>administrator — Administrator</li> <li>storageadmin — Storage Administrator</li> <li>operator — Operator (view only)</li> </ul> <p><b>Note:</b> Values are case-sensitive.</p> <p>Table 4 on page 35 provides a description of each user role.</p>                                                                              |

**Example**

The following command creates a user account that assigns user1 as local user to the operator role:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /user/account create -name
user1 -type local -passwd Password987! -role operator
```

```
ID = 1_Local/user1
```

```
Operation completed successfully.
```

**View user accounts**

View a list of user accounts. You can filter on the account ID.

**Note:** The [show action command on page 18](#) explains how to change the output format.

**Format**

```
/user/account [-id <value>] show
```

**Object qualifier**

| Qualifier | Description                    |
|-----------|--------------------------------|
| -id       | Type the ID of a user account. |

**Example**

The following command displays a list of all user accounts on the system:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /user/account show
```

```
1: ID = local_user1
 Name = user1
 Role = administrator
 Type = local

2: ID = ldapuser_ldapdomain.com/ldapUser
 Name = ldapdomain.com/ldapUser
 Role = operator
 Type = ldapuser

3: ID = ldapgroup_ldapdomain.com/ldapGroup
 Name = ldapdomain.com/ldapGroup
 Role = storagadmin
 Type = ldapgroup
```

## Change user accounts

Update a user account with new settings.

### Format

```
/user/account -id <value> set [-passwd <value> {-oldpasswd <value>}|-force}
[-role <value>]
```

### Object qualifier

| Qualifier | Description                                |
|-----------|--------------------------------------------|
| -id       | Type the ID of the user account to change. |

### Action qualifiers

| Qualifier  | Description                                                                                                                                                                                                                                                                                                                                                                                                                  |
|------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| -passwd    | Type a new password for a local user.<br>The following are the password requirements: <ul style="list-style-type: none"> <li>• Passwords must be 8 to 40 characters in length and cannot contain spaces.</li> <li>• Passwords must include mixed case, a number, and a special character from this list:<br/>!, @ # \$ % ^ * ? _ ~</li> <li>• When changing a password, do not reuse any of the last 3 passwords.</li> </ul> |
| -oldpasswd | Type the old password to set the new password.                                                                                                                                                                                                                                                                                                                                                                               |
| -force     | Reset the password.<br><br><b>Note:</b> You must be an administrator to use this qualifier.                                                                                                                                                                                                                                                                                                                                  |
| -role      | Type the name of a new role for the user account. Value is one of the following: <ul style="list-style-type: none"> <li>• administrator — Administrator</li> <li>• storageadmin — Storage Administrator</li> <li>• operator — Operator (view only)</li> </ul> <b>Note:</b> Values are case-sensitive.<br><br>Table 4 on page 35 provides a description of each user role.                                                    |

### Example

The following command changes the password for user account local\_user:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /user/account -id local_user
set -passwd NewPassword456! -oldpasswd OldPassword456!
```

```
ID = local_user
Operation completed successfully.
```

## Delete user accounts

Delete a user account.

### Format

```
/user/account -id <value> delete
```

### Object qualifier

| Qualifier | Description                                |
|-----------|--------------------------------------------|
| -id       | Type the ID of the user account to delete. |

### Example

The following command deletes user account local\_user1:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /user/account -id
user_user1 delete
```

Operation completed successfully.

## View installed feature licenses

View details for purchased feature licenses. These licenses were purchased when your system was purchased. You must install licenses on your system before you can use a particular feature or perform tasks, such as creating storage.

To install a license, use the **-upload** switch to upload it to the system. [View the switches on page 24](#) provides details on all available switches.

[Table 5 on page 40](#) lists and describes the attributes for product licenses.

**Table 5 License attributes**

| Attribute    | Description                                                                                                                                                                                                                                                                                                                                                                                              |
|--------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Feature      | Name of the feature.                                                                                                                                                                                                                                                                                                                                                                                     |
| Installed    | Indication of whether a feature is installed with the license. Value is yes or no.                                                                                                                                                                                                                                                                                                                       |
| Version      | Version of the license.                                                                                                                                                                                                                                                                                                                                                                                  |
| Issued       | Date when the license was made available.                                                                                                                                                                                                                                                                                                                                                                |
| Expires      | Date when the license will expire.                                                                                                                                                                                                                                                                                                                                                                       |
| Health state | Health state of the license. The health code appears in parentheses. Value is one of the following: <ul style="list-style-type: none"> <li>OK (5) — License is active.</li> <li>Degraded/Warning (10) — License will soon expire.</li> <li>Major failure (20) — License has expired.</li> </ul> To update a license that has expired or is about to expire, go to the Manage Licenses page in Unisphere. |

## View licenses

View details about installed licenses.

**Note:** [The show action command on page 18](#) explains how to change the output format.

### Format

```
/sys/lic show
```

### Example

The following command displays a list of all feature licenses on the system:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /sys/lic show
```

```
1: Feature = ISCSI
 Installed = yes
 Version = 1.1
 Issued = 2009-11-09
 Expires = 2010-11-09
 Health state = OK (5)

2: Feature = CIFS
 Installed = yes
 Version = 1.1
 Issued = 2009-01-19
 Expires = Never
 Health state = OK (5)
```



## View and accept the End User License Agreement

**Note:** Install Service Pack 3 (SP3) or higher of the system management software to use this functionality.

View the end user license agreement (EULA). You must accept the EULA prior to uploading product licenses or configuring the system.

### View the EULA

View the EULA as a text file. The output displays a URL for accessing the text file.

**Note:** [The show action command on page 18](#) explains how to change the output format.

#### Format

```
/sys/eula show
```

#### Example

The following command displays the agreement status of the EULA and a URL for viewing the EULA as a text file:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /sys/eula show
```

```
1: Agree = yes
 URL = https://10.0.0.1/eula.txt
```

### Accept the EULA

Accept the EULA prior to install product licenses and configure the system.

#### Format

```
/sys/eula set -agree yes
```

#### Example

The following command accepts the EULA:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /sys/eula set -agree yes
```

Operation completed successfully.

## Manage remote logging

Log system messages to a remote host. Create a setting for remote logging that specifies the following:

- ◆ The facility that will generate the log messages.
- ◆ The network name or IP address of a remote host that will receive the log data.

The remote host must be accessible from the system. Security for the log information must be provided through network access controls or the system security at the remote host. You can configure the log transmission method (UDP or TCP) and the host port that the system uses. By default, the system transfers log information on port 515 over the UDP protocol.

Log files record messages to flat log files. The user-level system messages are recorded in English. However, you can specify a facility to select the type of information contained in the logs, according to the system component that issues it, and the language of any text in the log.

[View event logs and alerts on page 204](#) explains viewing details about current logs and alerts on the system.

[Table 6 on page 42](#) lists the attributes for remote system logging.

**Table 6 Remote logging attributes**

| Attribute | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|-----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Enabled   | Indication of whether remote logging is currently enabled. Value is yes or no.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Host      | IP address or network name of the remote host.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Port      | Port number on the remote host. Default is 515.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Protocol  | Protocol for transferring the log. Value is TCP or UDP.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Facility  | Facility that will process the log. Value is one of the following: <ul style="list-style-type: none"> <li>• KERN — Kernel messages.</li> <li>• USER — User-level messages.</li> <li>• MAIL — Mail system.</li> <li>• DAEMON — System daemons.</li> <li>• AUTH — Security/authorization messages.</li> <li>• Syslog — Message generated internally by syslogd (default).</li> <li>• LPR — Line printer subsystem.</li> <li>• NEWS — Network news subsystem.</li> <li>• UUCP — UNIX-to-UNIX copy.</li> <li>• CRON — Clock daemon.</li> <li>• AUTHPRIV — Security/authorization messages.</li> <li>• FTP — FTP daemon.</li> </ul> |

## View settings for remote logging

View details about configured settings for remote logging.

**Note:** The [show action command on page 18](#) explains how to change the output format.

### Format

```
/sys/rlog show
```

### Example

The following command displays the settings for remote system logging:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /event/rlog show
```

```
1: Enabled = yes
 Host = 10.64.75.201
 Port = 500
 Protocol = UDP
 Facility = Kernel messages
```

## Configure settings for remote logging

Configure settings for remote system logging.

### Format

```
/sys/rlog set [-enabled {yes|no}] [-host <value>] [-port <value>] [-protocol
{UDP|TCP}] [-facility
{KERN|USER|MAIL|DAEMON|AUTH|SYSLOG|LPR|NEWS|UUCP|CRON|AUTHPRIV|FTP}]
```

**Action qualifier**

| Qualifier | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|-----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| -enabled  | Specify to enable remote system logging. Value is yes or no.<br>If you specify yes, include <b>-host &lt;value&gt;</b> , where <i>value</i> is the IP address of the target remote host that will receive the logs.                                                                                                                                                                                                                                                                                                                                                                                                                           |
| -host     | Type the IP address or network name of the remote host that will receive the log files.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| -port     | Type the port number on the remote host. Default is 515.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| -protocol | Type the protocol for transferring the log files. Value is TCP or UDP.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| -facility | Type the facility that will process the log files. Value is one of the following: <ul style="list-style-type: none"> <li>• KERN — Kernel messages.</li> <li>• USER — User-level messages.</li> <li>• MAIL — Mail system.</li> <li>• DAEMON — System daemons.</li> <li>• AUTH — Security/authorization messages.</li> <li>• Syslog — Message generated internally by syslogd (default).</li> <li>• LPR — Line printer subsystem.</li> <li>• NEWS — Network news subsystem.</li> <li>• UUCP — UNIX-to-UNIX copy.</li> <li>• CRON — Clock daemon.</li> <li>• AUTHPRIV — Security/authorization messages.</li> <li>• FTP — FTP daemon.</li> </ul> |

**Example**

The following command configures remote system logging with these settings:

- ◆ Remote target host is 10.64.74.12
- ◆ Uses host port 500.
- ◆ Uses protocol UDP.
- ◆ Uses the MAIL facility.

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /sys/rlog set -enabled yes
 -host 10.64.74.12 -port 500 -protocol UDP -facility MAIL
```

Operation completed successfully.

## View system software versions

Display details about the version of the installed system software and the software upgrade candidate that has been uploaded to the system. [Upgrade the system software on page 46](#) explains how to upgrade the system software.

[Table 7 on page 45](#) lists the system software attributes.

**Table 7 System software attributes**

| Attribute      | Description                                                                                                                                                                                                                                                                    |
|----------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ID             | ID of the system software.                                                                                                                                                                                                                                                     |
| Type           | System software type. Value is one of the following: <ul style="list-style-type: none"> <li>installed — System software that is currently installed on the system.</li> <li>candidate — Upgrade candidate uploaded to the system for upgrading the system software.</li> </ul> |
| Version        | Software version.                                                                                                                                                                                                                                                              |
| Release date   | Software release date.                                                                                                                                                                                                                                                         |
| Image filename | Filename of the software image.                                                                                                                                                                                                                                                |

**Note:** The [show action command on page 18](#) explains how to change the output format.

### Format

```
/sys/soft/ver [{-id <value>|-type {installed|candidate}}] show
```

### Object qualifiers

| Qualifier | Description                                                                                                                                                                                                                                                                                                                                    |
|-----------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| -id       | Type the ID of the system software.                                                                                                                                                                                                                                                                                                            |
| -type     | Type the software type. Value is one of the following: <ul style="list-style-type: none"> <li>installed — View the version of the system software that is installed.</li> <li>candidate — View the version of the system software upgrade candidate that was uploaded to the system.</li> </ul> <p><b>Note:</b> Values are case-sensitive.</p> |

### Example

The following command displays details about the installed system software and an uploaded upgrade candidate:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /sys/soft/ver show
```

```
1: ID = INST_1
 Type = installed
 Version = 0.1.0.1487
 Release date = 2009-04-30

2: ID = CAND_1
 Type = candidate
 Version = 0.1.0.2187
 Release date = 2009-11-14
```

## Upgrade the system software

Create an upgrade session to upgrade the system software or view existing upgrade sessions. The upgrade session installs an upgrade candidate file that was uploaded to the system. Download the latest upgrade candidate from EMC Online Support website. Use the **-upload** switch to upload it to the system before creating the upgrade session. [View the switches on page 24](#) provides details for all available switches.

The latest software upgrade candidate contains all available hot fixes. If you have applied hot fixes to your system, the hot fixes will be included in the latest upgrade candidate.

**Note:** All system components must be healthy, prior to upgrading the system software. If any system components are degraded, the software update will fail. [Perform a system health check on page 34](#) explains how to run a health check on the system.

[Table 8 on page 46](#) lists the attributes for upgrade sessions.

**Table 8 Upgrade session attributes**

| Attribute     | Description                                                                                                                                                                                                                                                                                         |
|---------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Status        | Current status of the upgrade session. Value is one of the following: <ul style="list-style-type: none"> <li>running — Session is upgrading the system software.</li> <li>completed — Session has completed upgrading the system software.</li> <li>failed — Upgrade session has failed.</li> </ul> |
| Progress      | Current progress of the upgrade session.                                                                                                                                                                                                                                                            |
| Creation time | Date and time when the upgrade session was created.                                                                                                                                                                                                                                                 |
| Elapsed time  | Amount of time that the upgrade session has been running.                                                                                                                                                                                                                                           |

## Create upgrade sessions

Create a session to upgrade the system software with an uploaded upgrade candidate.



### CAUTION

**Do not use Unisphere or Unisphere CLI to manage or configure the system during a software upgrade.**

### Format

```
/sys/soft/upgrade create -candId <value>
```

### Action qualifiers

| Qualifier | Description                                                                                                                                                                |
|-----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| -candId   | Type the ID of the uploaded upgrade candidate.<br><a href="#">View system software versions on page 45</a> explains how to view the ID of the uploaded software candidate. |

### Example

The following command creates a session to upgrade the system software to upgrade candidate CAND\_1:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /sys/soft/upgrade create
-candId CAND_1
```

```
ID = UPGSES_1
Operation completed successfully.
```

## View upgrade sessions

View details for an existing software upgrade session.

**Note:** The [show action command on page 18](#) explains how to change the output format.

### Format

```
/sys/soft/upgrade show
```

### Example

The following command displays details about the system software upgrade session:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /sys/soft/upgrade show
```

```
1: Status = Running
 Progress = Task 5 of 25 (Stopping c4 stack on SPA)
 Creation time = 2009-11-09 19:43:08
 Elapsed time = 01h 43m 08s

2: Status = Failed
 Progress = Task 5 of 25 (Stopping c4 stack on SPA)
 Creation time = 2009-11-09 19:43:08
 Elapsed time = 00h 20m 08s
```

## Manage snapshot protection schedules

To schedule snapshot creation, you assign a protection schedule to the storage resource of which to take snapshots. Schedules contain one or more task rules that define the time and frequency when snapshots of the storage resource are taken. When you create a task rule you can assign it to an existing schedule or the system will automatically assign it to a new schedule. [Manage task rules on page 50](#) explains how to set up task rules. [Manage snapshots on page 186](#) explains how to create snapshots manually and manage existing snapshots.

Each protection schedule is identified by an ID.

[Table 9 on page 48](#) lists the attributes for protection schedules.

**Table 9 Protection schedule attributes**

| Attribute | Description                                                                                                                                                           |
|-----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ID        | ID of the schedule.                                                                                                                                                   |
| Name      | Name of the schedule.                                                                                                                                                 |
| Type      | Type of schedule. Value is one of the following: <ul style="list-style-type: none"> <li>System — Defined by the system.</li> <li>User — Defined by a user.</li> </ul> |
| Rules     | List of IDs for each task rule in the schedule.<br><a href="#">Manage task rules on page 50</a> provides details about schedule rules.                                |

## View protection schedules

View details about protection schedules. You can filter on the schedule ID.

**Note:** [The show action command on page 18](#) explains how to change the output format.

### Format

```
/sys/task/sched [-id <value>] show
```

### Object qualifier

| Qualifier | Description                |
|-----------|----------------------------|
| -id       | Type the ID of a schedule. |

### Example

The following command displays details about all schedules (user- and system-defined) on the system:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /sys/task/sched show
```

```
1: ID = LessProtectionID
 Name = Less Protection
 Type = System
 Rules = RULE_1, RULE2

2: ID = DefaultProtectionID
 Name = Default Protection
 Type = System
 Rules = RULE_3
```



```
3: ID = MySchedID
 Name = MySched1
 Type = User
 Rules = RULE_4
```

## Delete protection schedules

Delete a user-defined protection schedule. You cannot delete a system-defined schedule.

**Note:** When you delete a schedule, all rules associated with the schedule are also deleted.

### Format

```
/sys/task/sched [-id <value>] delete
```

### Object qualifier

| Qualifier | Description                            |
|-----------|----------------------------------------|
| -id       | Type the ID of the schedule to delete. |

### Example

The following command deletes schedule MySchedID:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /sys/task/sched -id
MySchedID delete
```

Operation completed successfully.

## Manage task rules

Task rules define the time and frequency when a task, such as snapshot creation, will occur. When you create a task rule, you can assign it to an existing protection schedule or the system automatically assigns it to a new schedule. You then assign the schedule to the storage resource of which to schedule snapshots. [Manage snapshot protection schedules on page 48](#) explains how to view and delete protection schedules.

Table 10 on page 50 lists the attributes for task rules.

**Table 10 Task rule attributes**

| Attribute | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|-----------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ID        | ID of the rule.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Type      | Type of rule, which specifies when a task executes. Value is one of the following: <ul style="list-style-type: none"> <li>HoursInterval — Task executes on an interval of the specified number of hours or minutes within an hour.</li> <li>HoursList — Task executes everyday on the specified hours and, optionally, on a specific minute within the specified hour.</li> <li>DaysInterval — Task executes on an interval of the specified number of days and, optionally, on a specific hour of each specified day.</li> <li>WeekDaysList — Task executes on the specified days of the week or on a specific hour of each specified day.</li> <li>MonthDaysList — Task executes each month on a specified day and time.</li> </ul> |
| Frequency | Frequency that a task executes.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Keep for  | For snapshots, the amount of time the system retains a snapshot before deleting it.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |

## Create task rules

Create a task rule.

### Format

```
/sys/task/rule create {-schedId <value>|-schedName <value>} -type
{HoursInterval -every <value> [-at <value>]|HoursList -hours <value> [-at
<value>]|DaysInterval -every <value> [-at <value>]|WeekDaysList -days
<value> [-at <value>]|MonthDaysList -days <value> [-at <value>]] [-keepFor
<value>]
```

## Action qualifiers

| Qualifier  | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| -schedId   | Type the ID of an existing protection schedule to which to assign the rule.<br><a href="#">View protection schedules on page 48</a> explains viewing details about existing schedules, including their IDs.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| -schedName | Type a name for a new protection schedule to which to assign the rule.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| -type      | Specify the type of rule, which indicates how often the task will execute. Value is one of the following: <ul style="list-style-type: none"> <li>HoursInterval — Task executes on an interval of the specified number of hours or minutes within an hour.</li> <li>HoursList — Task executes everyday on the specified hours and, optionally, on a specific minute within the specified hour.</li> <li>DaysInterval — Task executes on an interval of the specified number of days and, optionally, on a specific hour of each specified day.</li> <li>WeekDaysList — Task executes on the specified days of the week or on a specific hour of each specified day.</li> <li>MonthDaysList — Task executes each month on a specified day and time.</li> </ul> |
| -every     | If the value of <b>-type</b> is HoursInterval or DaysInterval, type the time interval when the task will execute. Value is one of the following: <ul style="list-style-type: none"> <li>HoursInterval — Number of hours within the range 1–24.</li> <li>DaysInterval — Number of days within the range 1–31.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| -hours     | If the value of <b>-type</b> is HoursList, type a comma-separated list of the hours of the day when the task will execute. The range is 0–23.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |

| Qualifier | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|-----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| -at       | <p>Type the specific number of minutes of an hour and the minutes of a day when the task will execute based on the value of <b>-type</b>. Value is one of the following:</p> <ul style="list-style-type: none"> <li>HoursInterval or HoursList — Type the number of minutes after the hour within the range 0–59. Default is 0.</li> <li>DaysInterval, WeekDaysList, or MonthDaysList — Type the time of a day in the following format:<br/> <code>&lt;HH&gt; [ : &lt;MM&gt; ]</code><br/> where: <ul style="list-style-type: none"> <li><code>HH</code> — Hour of the day.</li> <li><code>MM</code> — Minutes within the specified hour.</li> </ul> Value range is 0:00–23:59. Default value is 0:00.</li> </ul>           |
| -days     | <p>If the value of <b>-type</b> is WeekDaysList or MonthDaysList, type the days of the week or the day of the month when the task will execute:</p> <ul style="list-style-type: none"> <li>WeekDaysList—Type a comma-separated list of the days of the week. Value is one of the following: <ul style="list-style-type: none"> <li>Mon — Monday</li> <li>Tue — Tuesday</li> <li>Wed — Wednesday</li> <li>Thu — Thursday</li> <li>Fri — Friday</li> <li>Sat — Saturday</li> <li>Sun — Sunday</li> </ul> </li> <li>MonthDaysList — Type the day of the month within the range 1–31.</li> </ul> <p><b>Note:</b> Values are case-sensitive.</p> <p><b>Note:</b> For MonthDaysList, you can specify only 1 day of the month.</p> |
| -keepFor  | <p>Type the number of days or hours the system will retain a snapshot before deleting it. Use the following format:</p> <code>&lt;value&gt; [&lt;qualifier&gt;]</code><br>where: <ul style="list-style-type: none"> <li><code>value</code> — Type the number of hours or days. Value is: <ul style="list-style-type: none"> <li>Hours — Number of hours within the range 1–24.</li> <li>Days — Number of days within the range 1–31.</li> </ul> </li> <li><code>qualifier</code> — Type the value qualifier. Value is one of the following: <ul style="list-style-type: none"> <li><code>h</code> — Indicates hours.</li> <li><code>d</code> — Indicates days.</li> </ul> </li> </ul> <p>Default value is 1h (1 hour).</p>  |

### Example 1

The following command creates a task rule with these settings:

- ◆ Assigns the rule to the new protection schedule MyScheduleID.
- ◆ Takes a snapshot every 12 hours and 30 minutes.
- ◆ Keeps the snapshot for 10 hours before deleting it:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /sys/task/rule create
-schedName MyScheduleID -type HoursInterval -every 12 -at 30 -keepFor 10h
```

```
ID = RULE_1
Schedule ID = MyScheduleID
Operation completed successfully.
```

**Example 2**

The following command creates a task rule with these settings:

- ◆ Assigns the rule to the existing protection schedule MySchedID.
- ◆ Takes a snapshot everyday at 12:30 a.m., 8:30 a.m., and 8:30 p.m.:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /sys/task/rule create
-schedId MySchedID -type HoursList -hours "0,8,20" -at 30
```

```
ID = RULE_2
```

```
Operation completed successfully.
```

**Example 3**

The following command creates a task rule with these settings:

- ◆ Assigns the rule to the existing protection schedule MySchedID.
- ◆ Takes a snapshot every 2 days at 1:20 p.m.
- ◆ Keeps the snapshot for 1 week (7 days) before deleting it:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /sys/task/rule create
-schedId MySchedID -type DaysInterval -every 2 -at 13:20 -keepFor 7d
```

```
ID = RULE_3
```

```
Operation completed successfully.
```

**Example 4**

The following command creates a task rule with these settings:

- ◆ Assigns the rule to the existing protection schedule MySchedID.
- ◆ Takes a snapshot every Monday, Wednesday, and Friday at 6 a.m.:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /sys/task/rule create
-schedId MySchedID -type WeekDaysList -days "Mon,Wed,Fri" -at 6
```

```
ID = RULE_4
```

```
Operation completed successfully.
```

**Example 5**

The following command creates a task rule with these settings:

- ◆ Assigns the rule to the existing protection schedule MySchedID.
- ◆ Takes a snapshot on the first day of every month at 12 p.m.:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /sys/task/rule create
-schedId MySchedID -type MonthDaysList -days 1
```

```
ID = RULE_5
```

```
Operation completed successfully.
```

## View task rules

View details about task rules. You can filter on the ID of a rule or type the ID of a protection schedule to view only the rules assigned to that schedule.

**Note:** The [show action command on page 18](#) explains how to change the output format.

### Format

```
/sys/task/rule [{-id <value>|-schedId <value>}] show
```

### Object qualifiers

| Qualifier | Description                                                                |
|-----------|----------------------------------------------------------------------------|
| -id       | Type the ID of a rule.                                                     |
| -schedId  | Type the ID of a protection schedule to view the rules associated with it. |

### Example

The following command lists details for all task rules assigned to protection schedule SCHD\_3:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /sys/task/rule -schedId SCHD_3 show
```

```
1: ID = RULE_1
 Type = HoursInterval
 Frequency = Every 12h at 30m after the hour
 Keep for = 10h

2: ID = RULE_2
 Type = HoursList
 Frequency = Every day at 0:20, 8:20, 20:20
 Keep for = 1h

3: ID = RULE_3
 Type = DaysInterval
 Frequency = Every 2d at 13:20
 Keep for = 7d

4: ID = RULE_4
 Type = WeekDaysList
 Frequency = Every Mon, Wed, Fri at 6:00
 Keep for = 1h

5: ID = RULE_5
 Type = MonthDaysList
 Frequency = Every 1st, 2nd, 3rd day of month at 0:00
 Keep for = 1h
```

## Delete task rules

Delete a task rule.

**Note:** You cannot delete a rule that is associated with a system-defined schedule, only a user-defined schedule. Also, when you delete the last rule in a schedule, the schedule is also deleted.

### Format

```
/sys/task/rule -id <value> delete
```

### Object qualifier

| Qualifier | Description                        |
|-----------|------------------------------------|
| -id       | Type the ID of the rule to delete. |

### Example

The following command deletes rule RULE\_1:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /sys/task/rule -id RULE_1
delete
```

Operation completed successfully.





# 4

## Configure Network Communication

This chapter addresses the following topics:

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| Manage reverse CHAP for mutual CHAP authentication ..... | 63 |
| Set up ISNS for iSCSI storage .....                      | 65 |
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## Manage Shared Folder Servers

Shared Folder Servers are software components on the system that are dedicated to managing operations for data transferred through the CIFS or NFS protocols. You must configure at least one Shared Folder Server before you can create network share storage. You can configure a Shared Folder Server to support Windows network shares (CIFS), Linux/UNIX network shares (NFS), or both.

Shared Folder Servers run on each SP and communicate with network hosts through SP ports. When configuring a Shared Folder Server, indicate the network interface that it will use to identify and communicate through the appropriate SP.

Once you configure a Shared Folder Server, you can then create shared folders from which you export NFS or CIFS network shares. Configured hosts map or mount the network shares to access the shared folder storage.

Each Shared Folder Server is identified by an ID.

[Table 11 on page 58](#) lists the attributes for Shared Folder Servers.

**Table 11 Shared Folder Server attributes**

| Attribute         | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|-------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ID                | ID of the Shared Folder Server.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Name              | Name of the Shared Folder Server.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Health state      | Health state of the Shared Folder Server. The health state code appears in parentheses. Value is one of the following: <ul style="list-style-type: none"> <li>Unknown (0) — Status is unknown.</li> <li>OK (5) — Working correctly.</li> <li>Degraded/Warning (10) — Working and performing all functions, but the performance may not be optimum.</li> <li>Critical failure (25) — Failed and recovery may not be possible. This condition has resulted in data loss and should be remedied immediately.</li> </ul>                              |
| SP                | Primary SP on which the Shared Folder Server runs. Value is SPA or SPB.<br><br><b>Note:</b> If the primary SP is degraded or has failed, the server fails over to the other SP. The value displays the current SP the server is using in parentheses. For example, SPA (failed over to SPB).                                                                                                                                                                                                                                                      |
| CIFS enabled      | Indication of whether CIFS shared folders are enabled on the Shared Folder Server. Value is yes or no. Default is no. CIFS shared folders provide support for CIFS network shares.                                                                                                                                                                                                                                                                                                                                                                |
| NFS enabled       | Indication of whether NFS shared folders are enabled on the Shared Folder Server. Value is yes or no. Default is yes. NFS shared folders provide support for NFS network shares.                                                                                                                                                                                                                                                                                                                                                                  |
| Interface         | ID of the network interface assigned to the Shared Folder Server that defines the server IP address and allows the server to communicate with the network and hosts. <a href="#">Manage network interfaces on page 74</a> explains how to configure network interfaces on the system.                                                                                                                                                                                                                                                             |
| Windows domain    | For support of CIFS shared folders, the Windows domain name.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Organization unit | For support of CIFS shared folders, the organizational unit setting for the Active Directory domain. In Active Directory, organizational units represent containers where users, groups, computers, and other organizational units are organized. They provide the smallest scope or unit to which you can assign Group Policy settings or delegate administrative authority in an Active Directory environment.<br>The default value is:<br>ou=Computers:ou=EMC Celerra<br>The Unisphere online help provides more details about this attribute. |

## Create Shared Folder Servers

Create a Shared Folder Server. You can create a maximum of 12 Shared Folder Servers per SP.

### Format

```
/net/nas/server create -name <value> -if <value> [-enableNFS {yes|no}]
[-enableCIFS {yes -cifsDomain <value> -cifsDomUser <value> -cifsDomPwd
<value> [-cifsOrgUnit <value>}] |no}]
```

### Action qualifiers

| Qualifier    | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|--------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| -name        | Type a name for the Shared Folder Server.<br><br><b>Note:</b> Storage server names can contain alphanumeric characters, a single dash, and a single underscore. Server names cannot contain spaces or begin or end with a dash. You can create Storage Server names in four parts that are separated by periods (example: aa.bb.cc.dd). Names can contain up to 255 characters, but the first part of the name (before the first period) is limited to 15 characters. |
| -if          | Type the ID of a network interface to assign to the Shared Folder Server. The interface assigns an IP address to the server and allows the server to communicate with the network and hosts. <a href="#">Manage network interfaces on page 74</a> explains how to view and manage network interfaces.                                                                                                                                                                 |
| -enableNFS   | Enable NFS shared folders on the Shared Folder Server. Value is yes or no. Default is yes.                                                                                                                                                                                                                                                                                                                                                                            |
| -enableCIFS  | Enable CIFS shared folders on the Shared Folder Server. Value is yes or no. Default is no.                                                                                                                                                                                                                                                                                                                                                                            |
| -cifsDomain  | For CIFS shared folders, type the Windows domain name.                                                                                                                                                                                                                                                                                                                                                                                                                |
| -cifsDomUser | For CIFS shared folders, type the username of the administrator account within the Windows domain.                                                                                                                                                                                                                                                                                                                                                                    |
| -cifsDomPwd  | For CIFS shared folders, type the user password of the administrator account within the Windows domain.                                                                                                                                                                                                                                                                                                                                                               |
| -cifsOrgUnit | For CIFS shared folders, type the organizational unit setting for the Active Directory domain. The default value is:<br>ou=Computers:ou=EMC Celerra<br>The Unisphere online help provides more details about this qualifier.                                                                                                                                                                                                                                          |

### Example

The following command creates a Shared Folder Server with these settings:

- ◆ Name is MySFS1.
- ◆ Associated to interface IF\_1.
- ◆ Supports NFS shared folders.

The server receives the ID SFS\_1:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /net/nas/server create -name
MySFS1 -if IF_1 -enableNFS yes
```

```
ID = SFS_1
Operation completed successfully.
```

## View Shared Folder Servers

View details about configured Shared Folder Servers, including their name, ID, and whether they have enabled support for CIFS shared folders or NFS shared folders. You can filter on the Shared Folder Server ID.

**Note:** The [show action command on page 18](#) explains how to change the output format.

### Format

```
/net/nas/server [-id <value>] show
```

### Object qualifier

| Qualifier | Description                            |
|-----------|----------------------------------------|
| -id       | Type the ID of a Shared Folder Server. |

### Example

The following command displays a list of all configured Shared Folder Servers:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /net/nas/server show
```

```
1: ID = SFS_1
 Name = MySFS1
 Health state = OK (5)
 CIFS enabled = yes
 NFS enabled = no
 SP = SPA
 Interface = IF_1

2: ID = SFS_2
 Name = MySFS2
 Health state = OK (5)
 CIFS enabled = no
 NFS enabled = yes
 SP = SPA
 Interface = IF_2
```

## Change Shared Folder Server settings

Modify an existing Shared Folder Server.

**Note:** [Manage network interfaces on page 74](#) explains how to modify the network interfaces associated with a Shared Folder Server.

### Format

```
/net/nas/server -id <value> set [-if <value>] [-enableNFS {yes|no}]
 [-enableCIFS {yes -cifsDomain <value> -cifsDomUser <value> -cifsDomPwd
 <value> [-cifsOrgUnit <value>]|no}]
```

## Object qualifier

| Qualifier | Description                                        |
|-----------|----------------------------------------------------|
| -id       | Type the ID of the Shared Folder Server to change. |

## Action qualifiers

| Qualifier    | Description                                                                                                                                                                                                                                                                                             |
|--------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| -if          | Type the ID of a network interface to assign to the Shared Folder Server. The interface assigns an IP address to the server and allows the server to communicate with the network and hosts. <a href="#">Manage network interfaces on page 74</a> explains how to create and manage network interfaces. |
| -enableNFS   | Enable NFS shared folders on the Shared Folder Server. Value is yes or no. Default is yes.                                                                                                                                                                                                              |
| -enableCIFS  | Enable CIFS shared folders on the Shared Folder Server. Value is yes or no. Default is no.                                                                                                                                                                                                              |
| -cifsDomain  | For CIFS shared folders, type the Windows domain name.                                                                                                                                                                                                                                                  |
| -cifsDomUser | For CIFS shared folders, type the username of the administrator account within the Windows domain.                                                                                                                                                                                                      |
| -cifsDomPwd  | For CIFS shared folders, type the user password of the administrator account within the Windows domain.                                                                                                                                                                                                 |
| -cifsOrgUnit | For CIFS shared folders, type the organizational unit setting for the Active Directory domain.<br>The default value is:<br>ou=Computers:ou=EMC Celerra<br>The Unisphere online help provides more details about this qualifier.                                                                         |

## Example

The following command updates Shared Folder Server SFS\_1 with these settings:

- ◆ Enable support for CIFS shared folders.
- ◆ Use Windows domain: domain\_1.
- ◆ Use organizational unit: unit\_1.

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /net/nas/server -id SFS_1
 set -enableCIFS yes -cifsDomain domain_1 -cifsDomUser user -cifsDomPwd
 password -cifsOrgUnit unit_1
```

```
ID = SFS_1
Operation completed successfully.
```

## Delete Shared Folder Servers

Delete a Shared Folder Server.

### Prerequisite

Before you can delete a Shared Folder Server, you must first delete all storage resources associated with it.



### CAUTION

**Deleting a Shared Folder Server removes all storage resources that use it, such as CIFS and NFS shared folders, and associated network shares and snapshots from the system. After the storage resource is deleted, the files and folders inside it cannot be restored from snapshots. Back up the data from the storage resource before deleting it from the system.**

### Format

```
/net/nas/server -id <value> delete
```

### Object qualifier

| Qualifier | Description                                        |
|-----------|----------------------------------------------------|
| -id       | Type the ID of the Shared Folder Server to delete. |

### Example

The following command deletes Shared Folder Server SFS\_1:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /net/nas/server -id SFS_1
delete
```

Operation completed successfully.

## Manage reverse CHAP for mutual CHAP authentication

The Challenge Handshake Authentication Protocol (CHAP) is a security protocol that defines a method for authenticating hosts (initiators) and iSCSI nodes (targets). When CHAP is enabled, an iSCSI target will “challenge” an initiator that attempts to establish a connection with it. If the initiator does not respond with a valid password (called a secret), the target refuses the connection. CHAP authentication can be one-way, where only the target authenticates the initiator, or reverse (also called mutual), where the target and initiator authenticate each other. Compared to one-way CHAP, enabling reverse CHAP provides an extra level of security. To set one-way CHAP authentication, create an iSCSI CHAP account for a host. [Manage iSCSI CHAP accounts for one-way CHAP authentication on page 112](#) explains the commands for configuring one-way CHAP authentication.

**Note:** For reverse CHAP, the secret password you specify applies to all iSCSI nodes on the system. Also, the CHAP secret specified for any host configuration must be different from the reverse CHAP password specified for iSCSI nodes.

### View reverse CHAP secret settings

View whether a reverse CHAP secret password has been configured for iSCSI nodes.

**Note:** [The show action command on page 18](#) explains how to change the output format.

#### Format

```
/net/iscsi/reversechap show
```

#### Example

The following command shows the current reverse CHAP setting:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /net/iscsi/reversechap show
```

```
1: Configured = yes
```

### Specify the reverse CHAP secret password

Specify the reverse CHAP secret authentication password for iSCSI nodes.

**Note:** Each secret password you type overwrites the existing password.

#### Format

```
/net/iscsi/reversechap set -secret <value>
```

#### Action qualifier

| Qualifier | Description                                                                                                 |
|-----------|-------------------------------------------------------------------------------------------------------------|
| -secret   | Type the reverse CHAP secret authentication password. Default value is an ASCII string of 12–16 characters. |

#### Example

The following command sets the reverse CHAP secret to xyz0123456789:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /net/iscsi/reversechap set
 -secret xyz0123456789
```

Operation completed successfully.

## Disable the reverse CHAP secret password

Reset the reverse CHAP secret password to disable reverse CHAP authentication.

### Format

```
/net/iscsi/reversechap reset
```

### Example

The following command resets the reverse CHAP secret password:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /net/iscsi/reversechap reset
```

Operation completed successfully.



## Set up ISNS for iSCSI storage

The ISNS protocol (ISNSP) allows centralized management of iSCSI devices. An ISNS server can provide services such as remote discovery and configuration for iSCSI nodes and hosts. When ISNSP is in use, both the iSCSI nodes (targets) and hosts (initiators) on the network must be configured to use the ISNS server. You create a single ISNS server record for the system. [Table 12 on page 65](#) lists the attributes for ISNS server records.

**Table 12 ISNS server record attributes**

| Attribute | Description                           |
|-----------|---------------------------------------|
| ID        | ID of the ISNS server record.         |
| Server    | Name or IP address of an ISNS server. |

### Create ISNS server records

Create an ISNS server record to specify an ISNS server for the system to use. When you create an ISNS server record, it will overwrite the existing record on the system.

#### Format

```
/net/isns create -server <value>
```

#### Action qualifier

| Qualifier | Description                                     |
|-----------|-------------------------------------------------|
| -server   | Type the name or IP address of the ISNS server. |

#### Example

The following command creates an ISNS server record for server IP address 10.5.2.128. The server record receives the ID ISNS\_10.5.2.128:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /net/isns create -server
10.5.2.128
```

```
ID = ISNS_10.5.2.128
Operation completed successfully.
```

### View ISNS server records

View details for configured ISNS server records.

**Note:** [The show action command on page 18](#) explains how to change the output format.

#### Format

```
/net/isns show
```

#### Example

The following command shows details for the ISNS server record:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /net/isns show
```

```
1. ID = ISNS_10.5.2.128
 Server = 10.5.2.128
```

## Delete ISNS server records

Delete an ISNS server record.

### Format

```
/net/isns -id <value> delete
```

### Object qualifiers

| Qualifier | Description                                      |
|-----------|--------------------------------------------------|
| -id       | Type the ID of the ISNS server record to delete. |

### Example

The following command deletes the ISNS server record ISNS\_10.5.2.128:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /net/isns delete
```

Operation completed successfully.

## Manage iSCSI nodes (servers)

iSCSI nodes, or iSCSI Servers, are software components on the system that are dedicated to managing operations for data transferred through the iSCSI protocol. You must configure at least one iSCSI node before you can create virtual disks to store your data. iSCSI nodes run on each SP and communicate with network hosts through the SP ports. When configuring an iSCSI node, you indicate on which SP you want the server to start up and run.

iSCSI nodes handle storage creation, monitoring, and management tasks for generic iSCSI storage resources. Once you create an iSCSI node, you can then create virtual disks, to which configured hosts connect to access the storage. Hosts connect to the virtual disk through iSCSI initiators.

Each iSCSI node is identified by an ID.

[Manage reverse CHAP for mutual CHAP authentication on page 63](#) explains how to configure reverse CHAP authentication between iSCSI hosts and nodes.

[Table 13 on page 67](#) lists the attributes for iSCSI nodes.

**Table 13 iSCSI node attributes**

| Attribute    | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|--------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ID           | ID of the iSCSI node.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Alias        | Name of the iSCSI node.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| IQN          | iSCSI qualified name (IQN) for the node.<br>The iSCSI protocol outlines a specific address syntax for iSCSI devices that communicate on a network. The iSCSI addresses are called IQNs. Each IQN includes a Type field, Date field, Naming Authority field, and String field. For example:<br><code>iqn.1992-07.com.emc:apm000650039080000-3</code>                                                                                                                                                        |
| SP           | Primary SP on which the node runs. Value is SPA or SPB.                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Health state | Health state of the iSCSI node. The health state code appears in parentheses. Value is one of the following: <ul style="list-style-type: none"> <li>Unknown (0) — Status is unknown.</li> <li>OK (5) — Working correctly.</li> <li>Degraded/Warning (10) — Working and performing all functions, but the performance may not be optimum.</li> <li>Critical failure (25) — Failed and recovery may not be possible. This condition has resulted in data loss and should be remedied immediately.</li> </ul> |
| Interfaces   | ID of each network interface assigned to the iSCSI node. The interface defines the IP address for the node and allows it to communicate with the network and hosts.<br><a href="#">Manage network interfaces on page 74</a> explains how to configure network interfaces on the system.                                                                                                                                                                                                                    |

## Create iSCSI nodes

Create an iSCSI node. The system automatically assigns the host IQN to the iSCSI target node.

### Format

```
/net/iscsi/node create -alias <value> -if <value>
```

### Action qualifiers

| Qualifier | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|-----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| -alias    | Type a name for the iSCSI node. The name cannot contain: \, /, :, ;, ,, =, *, +,  , [, ], ?, <, >, spaces, tabs, new lines, or ASCII control symbols.<br><br><b>Note:</b> Storage Server names can contain alphanumeric characters, a single dash, and a single underscore. Server names cannot contain spaces or begin or end with a dash. You can create Storage Server names in four parts that are separated by periods (example: aa.bb.cc.dd). Names can contain up to 255 characters, but the first part of the name (the part before the first period) is limited to 15 characters. |
| -if       | Type the ID for each network interface to assign to the iSCSI node. Separate the IDs with a comma. You can assign up to two interfaces to an iSCSI node.<br><a href="#">Manage network interfaces on page 74</a> explains how to configure network interfaces on the system.                                                                                                                                                                                                                                                                                                               |

### Example

The following command creates an iSCSI node with these settings:

- ◆ Alias (name) is MyISCSINode1.
- ◆ Network interfaces if\_1 and if\_2 are assigned.

The iSCSI node receives ID iSCSI\_node\_1:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /net/iscsi/node create
 -alias MyISCSINode1 -if "if_1,if_2"
```

```
ID = ISCSIN_1
Operation completed successfully.
```

## View iSCSI nodes

View details about iSCSI nodes. You can filter on the iSCSI node ID.

**Note:** [The show action command on page 18](#) explains how to change the output format.

### Format

```
/net/iscsi/node [-id <value>] show
```

### Object qualifier

| Qualifier | Description                   |
|-----------|-------------------------------|
| -id       | Type the ID of an iSCSI node. |

**Example**

The following command lists all iSCSI nodes on the system:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /net/iscsi/node show
```

```
1: ID = ISCSIN_1
 Alias = MyISCSIServer1
 IQN = iqn.1992-05.com.emc:fcnc821001340000-1
 Health state = OK (5)
 SP = SPA
 Interfaces = IF_1, IF_2

2: ID = ISCSIN_2
 Name = MyISCSIServer2
 IQN = iqn.1992-05.com.emc:fcnc821001340001-1
 Health state = OK (5)
 SP = SPA
 Interfaces = IF_1
```

**Change iSCSI node settings**

Change the network interfaces assigned to the node.

**Format**

```
/net/iscsi/node -id <value> set [-if <value>]
```

**Object qualifier**

| Qualifier | Description                              |
|-----------|------------------------------------------|
| -id       | Type the ID of the iSCSI node to change. |

**Action qualifiers**

| Qualifier | Description                                                                                                                                                                                                                                                                  |
|-----------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| -if       | Type the ID for each network interface to assign to the iSCSI node. Separate the IDs with a comma. You can assign up to two interfaces to an iSCSI node.<br><a href="#">Manage network interfaces on page 74</a> explains how to configure network interfaces on the system. |

**Example**

The following command assigns interface IF\_1 to iSCSI node ISCSIN\_1:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /net/iscsi/node -id ISCSIN_1
set -if "IF_1"
```

Operation completed successfully.

## Delete iSCSI nodes

Delete an iSCSI node.

### Prerequisite

Before you can delete a Shared Folder Server, you must first delete all storage resources associated with it.



### CAUTION

**Deleting an iSCSI node removes all iSCSI storage resources and associated snapshots from the system. After the node is deleted, the files and folders inside it cannot be restored from snapshots. Back up the data from the node before deleting it from system.**

### Format

```
/net/iscsi/node -id <value> delete
```

### Object qualifier

| Qualifier | Description                              |
|-----------|------------------------------------------|
| -id       | Type the ID of the iSCSI node to delete. |

### Example

The following command deletes iSCSI node ISCSIN\_1:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /net/iscsi/node -id ISCSIN_1
delete
```

Operation completed successfully.

## Manage Ethernet ports

View and change the settings for the Ethernet ports on each SP.

[Table 14 on page 71](#) describes the port attributes.

**Table 14 Ethernet port attributes**

| Attribute          | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|--------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ID                 | ID of the port.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| SP                 | Name of the SP on which the port resides. Value is SPA or SPB.                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Supported types    | Types of network interfaces the port supports. The supported interfaces are dependent on the port type. Value is one of the following: <ul style="list-style-type: none"> <li>• mgmt — Management interface.</li> <li>• net — Network interface for Windows (CIFS) and Linux/UNIX (NFS) storage.</li> <li>• iscsi — iSCSI interface for iSCSI storage.</li> </ul> <a href="#">Manage network interfaces on page 74</a> explains how to configure network interfaces on the system.                                 |
| MTU size           | Maximum transmission unit (MTU) packet size (in bytes) that the port can transmit. Default is 1500 bytes per packet.                                                                                                                                                                                                                                                                                                                                                                                               |
| Speed              | Current link speed of the port.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Health state       | Health state of the port. The health state code appears in parentheses. Value is one of the following: <ul style="list-style-type: none"> <li>• Unknown (0) — Status is unknown.</li> <li>• OK (5) — Port is operating normally.</li> <li>• OK BUT (7) — Lost communication, but the port is not in use.</li> <li>• Minor failure (15) — Lost communication. Check the network connection and connected cables.</li> <li>• Major failure (20) — Port has failed. Replace the SP that contains the port.</li> </ul> |
| Operational status | Operational status of the port. The operational status codes appear in parentheses.                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Aggregated port    | If the port is in a link aggregation, the ID of the link aggregation appears. <a href="#">Manage link aggregations on page 82</a> explains how to configure link aggregations on the SP ports.                                                                                                                                                                                                                                                                                                                     |

## View port settings

View details about the Ethernet ports. You can filter on the port ID.

**Note:** [The show action command on page 18](#) explains how to change the output format.

### Format

```
/net/port [-id <value>] show
```

### Object qualifier

| Qualifier | Description              |
|-----------|--------------------------|
| -id       | Type the ID of the port. |

**Example**

The following command shows the port settings for a system with a single SP:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /net/port show
```

```
1: ID = mgmt_SPA
 SP = SPA
 Supported types = mgmt
 MTU size = 1500
 Speed = 100 mbps/full duplex
 Status = OK
 Aggregated port ID = None

2: ID = eth0_SPA
 SP = SPA
 Supported types = net, iscsi
 MTU size = 1500
 Speed = 10 gbps
 Status = OK
 Aggregated port ID = la0_SPA

3: ID = eth1_SPA
 SP = SPA
 Supported types = net, iscsi
 MTU size = 9000
 Speed = 1 gbps
 Status = OK
 Aggregated port ID = la0_SPA

4: ID = eth2_SPA
 SP = SPA
 Supported types = net, iscsi
 MTU Size = 9000
 Speed = 1 gbps
 Status = OK
 Aggregated port ID = None
```

## Change port settings

Change the maximum transmission unit size for an Ethernet port.

**Format**

```
/net/port -id <value> set -mtuSize <value>
```



### Object qualifier

| Qualifier | Description              |
|-----------|--------------------------|
| -id       | Type the ID of the port. |

### Action qualifier

| Qualifier | Description                                                                                               |
|-----------|-----------------------------------------------------------------------------------------------------------|
| -mtuSize  | Type the maximum transmission unit packet size (in bytes) for the port. Default is 1500 bytes per packet. |

### Example

The following command sets the MTU size for Ethernet port 0 (eth0) on SP A to 9000 bytes:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /net/port -id eth0_spa set
-mtuSize 9000
```

```
ID = eth0_SPA
Operation completed successfully.
```

## Manage network interfaces

Create network interfaces to enable and control access between the system, the network, and configured hosts. For each interface you create, specify the IP address for the interface as well as the IP addresses for the subnet mask and gateway.

You can create the following types of interfaces:

- ◆ Network interface for controlling access to Windows (CIFS) and UNIX/Linux (NFS) file storage. You assign the interface to a Shared Folder Server.
- ◆ iSCSI interfaces for controlling access to iSCSI storage. You assign the interface to an iSCSI node.

The system configures each interface on an SP port. You have the option of indicating which SP the interface will use, either a physical port or a link aggregation port. You also have the option of specifying a virtual LAN (VLAN) ID, for communicating with VLAN networks. View details about existing interfaces, including the management interface that was configured on the system through the Connection Utility.

Each interface is identified by an ID.

Table 15 on page 74 lists the interface attributes with a description of each.

**Table 15 Interface attributes**

| Attribute    | Description                                                                                                                                                                                                                                                                                   |
|--------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ID           | ID of the interface.                                                                                                                                                                                                                                                                          |
| Type         | Interface type. Value is one of the following: <ul style="list-style-type: none"> <li>• net — Interface for file-based storage, such as shared folders.</li> <li>• iscsi — Interface for iSCSI storage.</li> </ul>                                                                            |
| Port         | ID of the physical port or link aggregation on an SP on which the interface is running. The ID includes the port name and SP name.                                                                                                                                                            |
| VLAN ID      | Virtual local area network (VLAN) ID for the interface. The interface uses the ID to accept packets that have VLAN tags. The value range is 0–4096.<br>If the VLAN ID is 0, which is the default, packets do not have VLAN tags. The Unisphere online help provides more details about VLANs. |
| MAC address  | MAC address of the interface.                                                                                                                                                                                                                                                                 |
| IPv4 mode    | IP version 4 mode for the interface. The value is static, to indicate that a user must specify the IPv4 attributes for the interface.                                                                                                                                                         |
| IPv4 address | IP (version 4) address.                                                                                                                                                                                                                                                                       |
| IPv4 netmask | IP (version 4) subnet mask.                                                                                                                                                                                                                                                                   |
| IPv4 gateway | IP (version 4) gateway address.                                                                                                                                                                                                                                                               |
| SP           | SP that uses the interface. Value is SPA or SPB.                                                                                                                                                                                                                                              |

## Create interfaces

Create an interface.

### Format

```
/net/if create -type {net|iscsi} -port <value> [-vlanId <value>] -ipv4 static
 -addr <value> -netmask <value> [-gateway <value>]
```

### Action qualifiers

| Qualifier | Description                                                                                                                                                                                                                                                                                                                                                                                      |
|-----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| -type     | Type the interface type. Value is one of the following: <ul style="list-style-type: none"> <li>net — Interface for file-based storage, such as shared folders.</li> <li>iscsi — Interface for iSCSI storage.</li> </ul>                                                                                                                                                                          |
| -port     | Type the ID of the SP port or link aggregation that will use the interface. Use the following format: <code>&lt;port&gt;_&lt;sp&gt;</code> where: <ul style="list-style-type: none"> <li>port — Name of the port, such as eth0.</li> <li>sp — Name of the SP that owns the port, such as SPA or SPB.</li> </ul> <a href="#">View port settings on page 71</a> explains how to view the port IDs. |
| -vlanId   | Type the virtual LAN (VLAN) ID for the interface. The interface uses the ID to accept packets that have VLAN tags. The value range is 0–4096. If the VLAN ID is 0, which is the default, packets do not have VLAN tags. The Unisphere online help provides more details about VLANs.                                                                                                             |
| -ipv4     | Specify to type the (IPv4) configuration information for the interface. Type the value static, to specify that you will manually type the configuration information.<br><b>Note:</b> If you include this qualifier, you must include the qualifiers -addr and -netmask to specify the IPv4 configuration information.                                                                            |
| -addr     | Type the IP address for the interface.                                                                                                                                                                                                                                                                                                                                                           |
| -netmask  | Type the subnet mask for the interface.                                                                                                                                                                                                                                                                                                                                                          |
| -gateway  | Type the gateway for the interface.<br><b>Note:</b> This qualifier configures the default gateway for the specified SP.                                                                                                                                                                                                                                                                          |

### Example

The following command creates a network interface for port eth0, that uses VLAN ID 1, on SP A. The interface receives the ID IF\_1:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /net/if create -type net
 -port eth0_SPA -vlanId 1 -ipv4 static -addr 192.168.1.1 -netmask
 255.255.255.0
```

ID = IF\_1

Operation completed successfully.

## View interfaces

View a list of interfaces on the system or a remote system used for replication. You can filter on the interface ID.

**Note:** The [show action command on page 18](#) explains how to change the output format.

### Format

```
/net/if [{-id <value>|-remSys <value>}] show
```

### Object qualifier

| Qualifier | Description                                                                                                               |
|-----------|---------------------------------------------------------------------------------------------------------------------------|
| -id       | Type the ID of an interface.                                                                                              |
| -remRes   | To view the interfaces on a remote storage resource in a replication session, type the ID of the remote storage resource. |

### Example

The following command displays all interfaces on the system:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /net/if show
```

```
1: ID = IF_1
 Port = eth0_spa
 VLAN ID =
 IPv4 address = 192.168.1.1
 IPv4 subnet mask = 255.255.255.0
 IPv4 gateway = N/A
 SP = SPA

2: ID = IF_2
 Port = eth1_spb
 VLAN ID = 1
 IPv4 address = 192.168.1.2
 IPv4 subnet mask = 255.255.255.0
 IPv4 gateway = 192.168.1.254
 SP = SPB
```

## Change interface settings

Change the settings for an interface.

### Format

```
/net/if -id <value> set [-vlanId <value>] [-ipv4 static [-addr
 <value>][-netmask <value>][-gateway <value>]]
```

## Object qualifier

| Qualifier | Description                             |
|-----------|-----------------------------------------|
| -id       | Type the ID of the interface to change. |

## Action qualifiers

| Qualifier | Description                                                                                                                                                                                                                                                                                                                                             |
|-----------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| -vlanId   | Type the virtual LAN (VLAN) ID for the interface. The interface uses the ID to accept packets that have VLAN tags. The value range is 0–4096.<br>If the VLAN ID is 0 (default) packets do not have VLAN tags. The Unisphere online help provides more details on VLANs.<br><br><b>Note:</b> You cannot change the VLAN ID for the management interface. |
| -ipv4     | Specify to type the (IPv4) configuration information for the interface. Type the value static, which specifies that you will manually type the configuration information.<br><br><b>Note:</b> If you include this qualifier, you must include the qualifiers -addr and -netmask to specify the IPv4 configuration information.                          |
| -addr     | Type the IP address for the interface.                                                                                                                                                                                                                                                                                                                  |
| -netmask  | Type the subnet mask for the interface.                                                                                                                                                                                                                                                                                                                 |
| -gateway  | Type the gateway for the interface.                                                                                                                                                                                                                                                                                                                     |

## Example

The following command changes the IP address for interface IF\_1:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /net/if -id IF_1 set -ipv4
static -addr 192.168.1.1 -netmask 255.255.255.0
```

```
ID = IF_1
Operation completed successfully.
```

## Delete interfaces

Delete an interface.

**Note:** You cannot delete the management interface. See the Unisphere online help for instructions on resetting the management interface.



### CAUTION

**Deleting an interface can break the connection between systems that use it, such as configured hosts.**

## Format

```
/net/if -id <value> delete
```

**Object qualifier**

| Qualifier | Description                             |
|-----------|-----------------------------------------|
| -id       | Type the ID of the interface to delete. |

**Example**

The following command deletes interface IF\_1:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /net/if -id IF_1 delete
```

Operation completed successfully.

## Manage static IP routes

A route determines where to forward a packet next so it can reach its destination, whether that destination is a network or host. A static route is a hard-coded path in the router that specifies how the router will get to a certain subnet by using a certain path. All routes have a value that allows the router to assign a priority to which type of routing is used first. In static routes, the value is 1 which means no matter what other protocol is running, the static route is used first.

**Note:** An IP route connects an interface (IP address) to the larger network through a gateway. Without the route, the interface is no longer accessible outside its immediate subnet. As a result, network shares and exports associated with the interface are no longer available to clients outside of its immediate subnet.

Each route is identified by an ID.

Table 16 on page 79 describes the attributes for static IP routes.

**Table 16 Static IP route attributes**

| Attribute    | Description                                                                                                                                                                                                                                                                                                                                                        |
|--------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ID           | ID of the route.                                                                                                                                                                                                                                                                                                                                                   |
| Interface ID | ID of the interface the route uses to reach the gateway. The interface is associated with a SP. <a href="#">View interfaces on page 76</a> explains how to view the network interface IDs.                                                                                                                                                                         |
| Route type   | Type of route. Values are: <ul style="list-style-type: none"> <li>default — Default gateway the system uses when it cannot find a route to a connected node.</li> <li>host — Static route to a specific host.</li> <li>net — Static route to a subnet IP address.</li> </ul>                                                                                       |
| Target       | IP address of the target network node based on the specified route type. Value is one of the following: <ul style="list-style-type: none"> <li>For default, there is no value, as the system will use the specified gateway IP address.</li> <li>For host, the value is the IP address of the host.</li> <li>For net, the value is a subnet IP address.</li> </ul> |
| Netmask      | For a subnet route, the IP address of the subnet mask.                                                                                                                                                                                                                                                                                                             |
| Gateway      | IP address of the gateway.                                                                                                                                                                                                                                                                                                                                         |

## Create IP routes

Create an IP route.

**Note:** To change a route, delete it and re-create it with the new settings.

### Format

```
/net/route create -if <value> -type {default|host -target <value>|net -target
<value> -netmask <value>} -gateway <value>
```

## Object qualifiers

| Qualifier | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|-----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| -if       | Type the ID of the interface that the route will use to reach the gateway. <a href="#">View interfaces on page 76</a> explains how to view the network interface IDs.<br><br><b>Note:</b> The system may not use the interface you type for the route. The system determines the best interface for the route automatically.                                                                                                                                |
| -type     | Type the type of route. Value is one of the following: <ul style="list-style-type: none"> <li>default — System uses the default gateway when it cannot find a route to a connected node.</li> <li>host — Create a route to a host.</li> <li>net — Create a route to a subnet.</li> </ul>                                                                                                                                                                    |
| -target   | Type the IP address for the target network node based on the value of <b>-type</b> . Value is one of the following: <ul style="list-style-type: none"> <li>For default, the system will use the IP address specified for <b>-gateway</b>.</li> <li>For host, type the IP address of a target host.</li> <li>For net, type the IP address of a target subnet. Include the <b>-netmask</b> qualifier to specify the IP address of the subnet mask.</li> </ul> |
| -netmask  | For a route to a subnet, type the IP address of the subnet mask.                                                                                                                                                                                                                                                                                                                                                                                            |
| -gateway  | Type the gateway IP address for the route.                                                                                                                                                                                                                                                                                                                                                                                                                  |

### Example

The following command creates a subnet route on interface IF\_1 to target IP address 10.64.74.10:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /net/route create -if IF_1
 -type net -target "10.64.74.10" netmask 255.255.255.0 -gateway "10.64.74.1"
```

ID = RT\_1

Operation completed successfully.

## View IP routes

View details about IP routes. You can filter on the route ID.

**Note:** [The show action command on page 18](#) explains how to change the output format.

### Format

```
/net/route [-id <value>] show
```

### Object qualifier

| Qualifier | Description             |
|-----------|-------------------------|
| -id       | Type the ID of a route. |



**Example**

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /net/route show
```

```
1: ID = RT_1
 Type = net
 Target = 10.64.74.10
 Netmask = 255.255.255.0
 Gateway = 10.0.0.1
 Interface = IF_1

2: ID = RT_2
 Type = default
 Target = N/A
 Netmask =
 Gateway = 10.64.74.2
 Interface = IF_2
```

**Delete IP routes**

Delete an IP route.

**Format**

```
/net/route -id <value> delete
```

**Object qualifier**

| Qualifier | Description                         |
|-----------|-------------------------------------|
| -id       | Type the ID of the route to delete. |

**Example**

The following command deletes route RT\_1:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /net/route -id RT_1 delete
```

Operation completed successfully.

## Manage link aggregations

Link aggregation lets you link physical ports (for example, port 0 and port 1) on a SP to a single logical port and therefore lets you use up to four Ethernet ports on the SP. If your system has two SPs, and you link two physical ports, the same ports on both SPs are linked for redundancy. For example, if you link port 0 and port 1, the system creates a link aggregation for these ports on SP A and a link aggregation on SP B.

Each link aggregation is identified by an ID.

**Note:** The cabling on SP A must be identical to the cabling on SP B, or you cannot configure link aggregation.

Link aggregation has the following advantages:

- ◆ Increases overall throughput since two physical ports are linked into one logical port.
- ◆ Provides basic load balancing across linked ports since the network traffic is distributed across multiple physical ports.
- ◆ Provides redundant ports so that if one port in a linked pair fails, the system does not lose connectivity.

**Note:** With link aggregation, both linked ports must be connected to the same switch and the switch must be configured to use link aggregation that uses the Link Aggregation Control Protocol (LACP). The documentation that came with your switch should provide more information on using LACP.

The Unisphere online help provides more details on cabling the SPs to the disk-array enclosures (DAEs).

[Table 17 on page 82](#) describes the attributes for link aggregation.

**Table 17 Link aggregation attributes**

| Attribute          | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|--------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ID                 | ID of the link aggregation. The ID is a combination of the link ID and the SP that contains the linked ports.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Ports              | IDs of the linked physical ports. The port names include the name of the SP that contains the ports.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| SP                 | Name of the SP on which the ports are linked. Value is SPA or SPB.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| MTU size           | Maximum transmission unit (MTU) packet size (in bytes) for the linked ports. Default is 1500 bytes per packet.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Health state       | Health state of the link aggregation. The health state code appears in parentheses. Value is one of the following: <ul style="list-style-type: none"> <li>• Unknown (0) — Status is unknown.</li> <li>• OK (5) — Working correctly.</li> <li>• OK BUT (7) — Lost connection, but the link aggregation is not in use.</li> <li>• Degraded/Warning (10) — Working and performing all functions, but the performance may not be optimum.</li> <li>• Minor failure (15) — Working and performing all functions, but overall performance is degraded. This condition has a minor impact on the system and should be remedied at some point, but does not need to be fixed immediately.</li> <li>• Major failure (20) — Failing and some or all functions may be degraded or not working. This condition has a significant impact on the system and should be remedied immediately.</li> <li>• Critical failure (25) — Failed and recovery may not be possible. This condition has resulted in data loss and should be remedied immediately.</li> <li>• Non-recoverable error (30) — Completely failed and cannot be recovered.</li> </ul> |
| Operational status | Operational status of the link aggregation. The operational status code appears in parentheses.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |

## Create link aggregations

Create a link aggregation by linking two physical ports on an SP to create a logical port.

**Note:** If your system has two SPs, the specified ports are automatically linked on both SPs for redundancy.

### Format

```
/net/la create -ports <value> [-mtuSize <value>]
```

### Action qualifiers

| Qualifier | Description                                                                                                                                              |
|-----------|----------------------------------------------------------------------------------------------------------------------------------------------------------|
| -ports    | Type the IDs of the physical ports to link on the SP. Separate the IDs with a comma. For example, to link ports 0 and 1 on SPA, type: eth0_SPA,eth1_SPA. |
| -mtuSize  | Type the MTU size (in bytes) for the linked ports. Default value is 1500.<br><b>Note:</b> If you want to support jumbo frames, type 9000.                |

### Example

The following command links port 0 and port 1 on SPA with the default MTU size. The system has two SPs, so port 0 and port 1 on SPB are also linked, which results in two link aggregation IDs:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /net/la -create -ports
 "eth0_SPA,eth1_SPA"
```

```
ID = la0_SPA
```

```
ID = la0_SPB
```

```
Operation completed successfully.
```

## View link aggregations

View details about link aggregations. You can filter on the link aggregation ID.

**Note:** If your system has two SPs, details about the link aggregation configured on each SP appear.

**Note:** The [show action command on page 18](#) explains how to change the output format.

### Format

```
/net/la [-id <value>] show
```

### Object qualifier

| Qualifier | Description                          |
|-----------|--------------------------------------|
| -id       | Type the ID of the link aggregation. |

**Example**

The following command shows the link aggregations on the system, in this case, for both SPA and SPB:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /net/la show
```

```
1: ID = la0_SPA
 SP = SPA
 Ports = eth0_SPA,eth1_SPA
 Health state = OK (5)

2: ID = la0_SPB
 SP = SPB
 Ports = eth0_SPB,eth1_SPB
 Health state = OK (5)
```

**Change link aggregations**

Change the settings of a link aggregation.

**Note:** If your system has two SPs, the specified link aggregation is updated on both SPs.

**Format**

```
/net/la -id <value> set [-ports <value>] [-mtuSize <value>]
```

**Object qualifier**

| Qualifier | Description                                    |
|-----------|------------------------------------------------|
| -id       | Type the ID of the link aggregation to change. |

**Action qualifiers**

| Qualifier | Description                                                                                                                                              |
|-----------|----------------------------------------------------------------------------------------------------------------------------------------------------------|
| -ports    | Type the IDs of the physical ports to link on the SP. Separate the IDs with a comma. For example, to link ports 0 and 1 on SPA, type: eth0_SPA,eth1_SPA  |
| -mtuSize  | Type the MTU size (in bytes) for the linked ports. Default is 1500 bytes per packet.<br><br><b>Note:</b> If you want to support jumbo frames, type 9000. |

**Example**

The following command changes the MTU size for link aggregation la0\_SPA to 9000 bytes. The system has two SPs, so MTU size is updated for both link aggregation IDs:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /net/la -id la0_SPA set
 -mtuSize 9000
```

```
ID = la0_SPA
ID = la0_SPB
Operation completed successfully.
```

## Delete link aggregations

Delete a link aggregation.

**Note:** If your system has two SPs, the specified bond is deleted from both SPs.

### Format

```
/net/la [-id <value>] delete
```

### Object qualifier

| Qualifier | Description                                    |
|-----------|------------------------------------------------|
| -id       | Type the ID of the link aggregation to delete. |

### Example

The following command deletes link aggregation la0\_SPA. The system has two SPs, so link aggregation la0\_SPB is also deleted:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /net/la -id la0_SPA delete
```

```
ID = la0_SPA
```

```
ID = la0_SPB
```

```
Operation completed successfully.
```

# Manage DNS settings

A domain name server (DNS) is a network service responsible for converting domain names to their corresponding IP addresses. The system uses DNS services to resolve network names and IP addresses for the network services it needs (for example, for NTP and SMTP servers) and so that it can obtain IP addresses for hosts addressed by network names rather than IP addresses.

During the initial system configuration process you must specify the network address of at least one DNS server for resolving hostnames to IP addresses. Later, you can add, delete, or change DNS server settings.

You can configure multiple DNS server domains to specify each domain and IP address of the DNS servers for the system to use. By default, the system uses the top entry in the list as the current DNS. The remaining list provides a hierarchy of DNS servers to use if the first-choice server becomes unavailable. If the first DNS server in the list becomes unavailable, the system proceeds to the next DNS server in the list, and so on. You can also specify default DNS server addresses to indicate which addresses the system will use first.

DNS server addresses are grouped under DNS server domains. Each domain is identified by a domain ID.



## CAUTION

**You must configure at least one valid DNS server entry in the domain for the system. Deleting the last DNS entry can disrupt network communication to the device, and potentially interrupt communication between the system and the hosts that use its storage resources.**

Table 18 on page 86 lists the attributes for DNS domains.

Table 18 DNS domain attributes

| Attribute    | Description                                                             |
|--------------|-------------------------------------------------------------------------|
| ID           | ID of the DNS domain.                                                   |
| Name         | Name of the DNS domain.                                                 |
| Name servers | List of IP addresses that correspond to the name servers in the domain. |

# Create DNS server domains

Configure a DNS server domain to specify the DNS server domain and IP addresses the system can use.

## Format

```
/net/dns/domain create -name <value> -nameServer <value>
```

## Action qualifiers

| Qualifier   | Description                                                                                                                                                                                                                                                 |
|-------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| -name       | Type the domain name for the DNS server.                                                                                                                                                                                                                    |
| -nameServer | Type a list of IP addresses for each DNS server to include in the domain. Separate the addresses with a comma. Type the addresses in the order that the system should use them.<br><br><b>Note:</b> The domain can contain a maximum of three IP addresses. |

### Example

The following command adds two DNS servers to the domain domain.one.com. The servers are grouped by domain under the ID DNS\_1:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /net/dns/domain create -name
"domain.one.com" -nameServer "10.64.74.34, 10.64.74.35"
```

ID = DNS\_1

Operation completed successfully.

## View DNS server domains

View details about configured DNS server domains. You can filter on the domain ID.

**Note:** The [show action command on page 18](#) explains how to change the output format.

### Format

```
/net/dns/domain [-id <value>] show
```

### Object qualifier

| Qualifier | Description                         |
|-----------|-------------------------------------|
| -id       | Type the ID of a DNS server domain. |

### Example

The following command lists all DNS server domains:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /net/dns/domain show
```

```
1: ID = DNS_1
 Name = domain.one.com
 Name Servers = 10.64.74.1,10.64.74.201
```

## Delete DNS server domains

Delete a DNS server domain.

**Note:** When you delete the domain all of its DNS server addresses are also deleted.

### Format

```
/net/dns/domain -id <value> delete
```

### Object qualifier

| Qualifier | Description                                  |
|-----------|----------------------------------------------|
| -id       | Type the ID the DNS server domain to delete. |

**Example**

The following command deletes the DNS domain domain.two.com:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /net/dns/domain delete -id
domain.two.com
```

Operation completed successfully.

**Designate default DNS addresses**

Designate one or more DNS server addresses for which you have created a DNS server domain as a default. The system uses the default server addresses first.

**Format**

```
/net/dns/config set -nameServer
```

**Action qualifier**

| Qualifier   | Description                                                                                                                                                                    |
|-------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| -nameServer | Type a list of DNS server addresses to designate as default addresses. Separate the addresses with a comma. The system uses the addresses in the order in which you type them. |

**Example**

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /net/dns/config set
-nameServer "128.222.132.29,128.222.132.32"
```

Operation completed successfully.

**View default DNS addresses**

View the DNS server addresses designated as a default.

**Note:** [The show action command on page 18](#) explains how to change the output format.

**Format**

```
/net/dns/config show
```

**Example**

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /net/dns/config show
```

```
1. Name Servers = 128.222.132.29, 128.222.132.32
```



## Manage NTP server settings

**Note:** You must configure at least 1 NTP server record on the system.

The system relies on the network time protocol (NTP) as a standard for synchronizing the system clock with other nodes on the network. NTP provides a way of synchronizing clocks of distributed systems within approximately one millisecond of each other. A Windows Active Directory domain controller can operate as a time server if the Windows Time Service is running on it.

Some applications will not operate correctly if the clock on the system is not synchronized with the clock on connected hosts. Configure the system and any connected hosts to use the same time server. Doing so does the following:

- ◆ Minimizes the chance that synchronization issues will arise between the system and connected hosts.
- ◆ Reduces the difficulty of reconciling timestamps used for log information in the different systems.

**Note:** When using a Shared Folder Server for CIFS network shares, the system cannot access an Active Directory domain unless the system is synchronized within five minutes of the Active Directory controller for the domain where the network shares reside.

You can configure a total of three NTP server addresses for the system. All NTP server addresses are grouped into a single NTP server record. You must configure at least 1 NTP server record on the system.

Table 19 on page 89 lists the attributes for the NTP server record.

**Table 19 NTP server record attributes**

| Attribute | Description                          |
|-----------|--------------------------------------|
| ID        | ID of the NTP server record.         |
| Server    | Name or IP address of an NTP server. |

## Create an NTP server record

Create an NTP server record to specify an IP address of each NTP server the system will use.

**Note:** By default, the first NTP server address you specify will become the primary.

### Format

```
/net/ntp/server create -server <value>
```

### Action qualifier

| Qualifier | Description                                   |
|-----------|-----------------------------------------------|
| -server   | Type the name or IP address of an NTP server. |

**Example**

The following creates an NTP server record that contains NTP server address 0.north-america.pool.ntp.org:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /net/ntp/server create
 -server 0.north-america.pool.ntp.org
```

ID = NTP\_0.north-america.pool.ntp.org  
Operation completed successfully.

**View NTP server settings**

View details about the NTP server record.

**Note:** The [show action command on page 18](#) explains how to change the output format.

**Format**

```
/net/ntp/server show
```

**Example**

The following command displays the NTP server record, which contains two NTP server addresses:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /net/ntp/server show
```

1. ID = NTP\_0.north-america.pool.ntp.org  
Server = 0.north-america.pool.ntp.org  
Primary = Yes
2. ID = NTP\_1.north-america.pool.ntp.org  
Server = 1.north-america.pool.ntp.org  
Primary = No

**Delete NTP server settings**

Delete an NTP server record to remove the NTP settings.

**Note:** If you delete the primary NTP server record, the system automatically determines the NTP server record to use.

**Format**

```
/net/ntp/server -id <value> delete
```

**Action qualifier**

| Qualifier | Description                                      |
|-----------|--------------------------------------------------|
| -id       | Type the ID of the NTP server setting to delete. |

**Example**

The following command deletes NTP server setting NTP\_10.5.1.207:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /net/ntp/server -id
 NTP_10.5.1.207 delete
```

Operation completed successfully.

## Manage NIS server domains

The Network Information Service (NIS) consists of a directory service protocol for maintaining and distributing system configuration information, such as user and group information, hostnames, and e-mail aliases to network hosts. For example, to back up data on shared folder shares, some NDMP products require information from NIS servers to back up shared folder data.

NIS server addresses are grouped under domains, which are identified by domain IDs.

Table 20 on page 91 lists the attributes for NIS servers domains.

**Table 20 NIS server domain attributes**

| Attribute    | Description                                            |
|--------------|--------------------------------------------------------|
| ID           | ID of the NIS server domain.                           |
| Domain       | Name of the NIS server domain.                         |
| IP addresses | List of IP addresses of the NIS servers in the domain. |

## Create NIS server domains

Create an NIS server domain to contain NIS server addresses for the system to use.

### Format

```
/net/nis/domain create -domain <value> -ip <value>
```

### Action qualifiers

| Qualifier | Description                                                                                             |
|-----------|---------------------------------------------------------------------------------------------------------|
| -domain   | Type a name for the NIS server domain.                                                                  |
| -ip       | Type the IP addresses of the NIS servers to include in the domain. Separate the addresses with a comma. |

### Example

The following command creates NIS server domain nis.one.com with two NIS server addresses:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /net/nis/domain create
 -domain nis.one.com -ip "10.64.75.0,10.64.74.1"
```

```
ID = nis.one.com
Operation completed successfully.
```

## View NIS server domains

View details about NIS server domains.

**Note:** The [show action command on page 18](#) explains how to change the output format.

### Format

```
/net/nis/domain [-id <value>] show
```

## Object qualifier

| Qualifier | Description                           |
|-----------|---------------------------------------|
| -id       | Type the ID of the NIS server domain. |

### Example

The following command displays details about the NIS server domain:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /net/nis/domain show
```

```
1: ID = NIS_1
 Domain = nis.one.com
 Servers = nisserver1.one.com, 10.64.74.1
```

## Change NIS server domains

Add NIS server addresses to an NIS server domain.

### Format

```
/net/nis/domain -id <value> set -ip <value>
```

### Object qualifier

| Qualifier | Description                                     |
|-----------|-------------------------------------------------|
| -id       | Type the ID of the NIS server domain to change. |

### Action qualifier

| Qualifier | Description                                                                                             |
|-----------|---------------------------------------------------------------------------------------------------------|
| -ip       | Type the IP addresses of the NIS servers to include in the domain. Separate the addresses with a comma. |

### Example

The following command adds a new IP address to NIS server domain nis.two.com:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /net/nis -id nis.two.com set
 -ip "10.64.74.200"
```

```
ID = nis.two.com
Operation completed successfully.
```

## Delete NIS server domains

Delete an NIS server domain. When you delete the NIS server domain, you also delete all of its NIS server addresses.

### Format

```
/net/nis/domain -id <value> delete
```

## Object qualifier

| Qualifier | Description                           |
|-----------|---------------------------------------|
| -id       | Type the ID of the NIS server domain. |

## Example

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /net/nis/domain -id
"nis.one.com" delete
```

Operation completed successfully.

## Manage SMTP server settings

The system uses the Simple Mail Transport Protocol (SMTP) to e-mail alerts, based on alert severity, of system events to specified e-mail addresses and to EMC support using ConnectEMC. Once you provide the IP address of the SMTP server to use, you can enable the following features on the system:

- ◆ E-mail alerts — The system sends e-mail alerts of system events to the specified IP address when it encounters alert or error conditions. The system uses the first IP address you specify.
- ◆ ConnectEMC — The system sends e-mail alerts of system events or errors to EMC support using ConnectEMC. After specifying the SMTP server IP address, enter the IP address for ConnectEMC.

[Configure alert settings on page 207](#) explains how to specify the alert severity of which to e-mail alerts. All IP addresses are grouped under a single SMTP server setting.

[Table 21 on page 94](#) lists the attributes for SMTP server settings.

**Table 21 SMTP server attributes**

| Attribute | Description                    |
|-----------|--------------------------------|
| ID        | ID of the SMTP server.         |
| Address   | IP address of the SMTP server. |

## View SMTP server settings

View the IP addresses of the SMTP server setting.

**Note:** [The show action command on page 18](#) explains how to change the output format.

### Format

```
/net/smtp [-id <value>] show
```

### Object qualifier

| Qualifier | Description                    |
|-----------|--------------------------------|
| -id       | Type the ID of an SMTP server. |

### Example

The following command lists the IP addresses of the two SMTP servers in the setting:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /net/smtp show
```

```
1: ID = default
 Address = 192.168.0.15

2: ID = connectEMC
 Address = 10.64.74.15
```

## Configure SMTP server settings

Specify the IP addresses for the SMTP server setting.

### Format

```
/net/smtp -id <value> set -addr <value>
```

### Object qualifier

| Qualifier | Description                                                       |
|-----------|-------------------------------------------------------------------|
| -id       | Type the ID of an SMTP server for which to specify an IP address. |

### Action qualifier

| Qualifier | Description                              |
|-----------|------------------------------------------|
| -addr     | Type the IP address for the SMTP server. |

### Example

The following command sets the IP address for the default SMTP server that the system will use:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /net/smtp -id default set
-addr 10.64.74.16
```

Operation completed successfully.

## Manage NDMP server settings

The Network Data Management Protocol (NDMP) provides a standard for backing up file servers on a network. NDMP allows centralized applications to back up file servers that run on various platforms and platform versions. NDMP reduces network congestion by isolating control path traffic from data path traffic, which permits centrally managed and monitored local backup operations.

Enable NDMP to use NDMP products for backing up and restoring data on shared folder storage.

Table 22 on page 96 lists the attributes for NDMP servers.

**Table 22 NDMP server attributes**

| Attribute | Description                                               |
|-----------|-----------------------------------------------------------|
| Enabled   | Indication of whether NDP is enabled. Value is yes or no. |
| Password  | Password for accessing the NDMP server.                   |

## View NDMP server settings

View whether NDMP is enabled or disabled.

**Note:** The [show action command on page 18](#) explains how to change the output format.

### Format

```
/net/ndmp show
```

### Example

The following command displays the NDMP settings, which show that NDMP is enabled:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /net/ndmp show
```

```
1: Enabled = yes
```

## Configure NDMP server settings

Configure NDMP server settings, which includes enabling or disabling NDMP and changing the password for accessing the NDMP server.

### Format

```
/net/ndmp set -enabled yes {yes -passwd <value>|no}
```

### Action qualifiers

| Qualifier | Description                                                                              |
|-----------|------------------------------------------------------------------------------------------|
| -enabled  | Enable NDMP. Value is yes or no. For yes, type the NDMP server password.                 |
| -passwd   | Type the password for the NDMP server. You must specify the password when enabling NDMP. |

### Example

The following command enables NDMP:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /net/ndmp set -enabled
-passwd "Password0123"
```



## Manage LDAP settings

The Lightweight Directory Access Protocol (LDAP) is an application protocol for querying and modifying directory services running on TCP/IP networks. LDAP provides central management for network authentication and authorization operations by helping to centralize user and group management across the network. Integrating the system into an existing LDAP environment provides a way to control user and user group access to the system through Unisphere CLI or Unisphere.

After you configure LDAP settings for the system, you can manage users and user groups, within the context of an established LDAP directory structure. For instance, you can assign access permissions to Unisphere CLI that are based on existing users and groups.

**Note:** The system uses the LDAP settings only for facilitating control of access to Unisphere CLI and Unisphere, not for access to storage resources.

Table 23 on page 97 lists the attributes for LDAP settings.

**Table 23 LDAP server attributes**

| Attribute            | Description                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|----------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ID                   | ID of the LDAP server.                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Name                 | Name of the LDAP server.                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Domain name          | Domain name for the LDAP server.                                                                                                                                                                                                                                                                                                                                                                                                             |
| Port                 | Port number used by the directory server for LDAP communications. By default, LDAP uses port 389, and LDAP over an SSL uses port 636.                                                                                                                                                                                                                                                                                                        |
| Protocol             | Indication of whether the LDAP protocol uses SSL for secure network communication. SSL provides encryption and authentication capabilities. SSL encrypts data over the network and provides message and server authentication. Value is one of the following: <ul style="list-style-type: none"> <li>Idap — LDAP without SSL.</li> <li>Idaps — LDAP with SSL, which is the default.</li> </ul>                                               |
| Bind DN              | Port number used by the directory server for LDAP communications. By default, LDAP uses port 389 and LDAP over SSL uses port 636.                                                                                                                                                                                                                                                                                                            |
| Bind password        | Base distinguished name (DN) of the root of the LDAP directory tree. The system uses the DN to bind to the LDAP service and determine where in the LDAP directory tree to begin a search for information. The base DN can be expressed as a fully qualified domain name or in X.509 format by using the attribute dc=.<br>For example, if the fully qualified domain name is mycompany.com, the base DN is expressed as dc=mycompany,dc=com. |
| User search path     | Path to search for users on the directory server. For example: ou=People,dc=iss,dc=emc,dc=com<br>On an Active Directory server, a default search path is used.                                                                                                                                                                                                                                                                               |
| Group search path    | Path to search for groups on the directory server. For example:<br>uid=<name>,ou=people,dc=<domaincomponent>,or dc=<domain component>.<br>On an Active Directory server, a default search path is used.                                                                                                                                                                                                                                      |
| User ID attribute    | Name of the LDAP attribute whose value indicates the user ID. Default value is uid.                                                                                                                                                                                                                                                                                                                                                          |
| User name attribute  | Name of the LDAP attribute whose value indicates the username. Default value is cn.                                                                                                                                                                                                                                                                                                                                                          |
| Group name attribute | Name of the LDAP attribute whose value indicates the group name. Default value is cn.                                                                                                                                                                                                                                                                                                                                                        |
| User object class    | LDAP object class for users. Default is user.<br>In Active Directory, groups and users are stored in the same hierarchical directory path and the class is called group.                                                                                                                                                                                                                                                                     |

**Table 23 LDAP server attributes (continued)**

| Attribute            | Description                                                                                                                                                                                                              |
|----------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Group object class   | LDAP object class for groups. Default value is group.<br>In Active Directory, groups and users are stored in the same directory path and the class is called group.                                                      |
| Group member class   | Name of the LDAP attribute whose value contains names of group members within a group. Default value is member.                                                                                                          |
| Certificate filepath | Path to the trusted certificate file used for one-way LDAP server authentication.                                                                                                                                        |
| LDAP timeout         | Timeout for the LDAP server in milliseconds. If the system does not receive a reply from the LDAP server after the specified timeout, it stops sending requests.<br>Default value is 30,000 milliseconds, or 30 seconds. |

## Configure LDAP settings

Configure LDAP settings to control user access to Unisphere CLI and Unisphere from an LDAP server.

### Format

```
/net/ldap create -name <value> -domain <value> [-port <value>] [-protocol
{ldap|ldaps -certFilePath <value>}] -bindDn <value> -bindPasswd <value>
-userSearchPath <value> [-groupSearchPath <value>] [-userIdAttr <value>]
[-groupNameAttr <value>] [-userObjectClass <value>] [-groupObjectClass
<value>] [-groupMemberAttr <value>] [-timeout <value>]
```

## Action qualifiers

| Qualifier         | Description                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|-------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| -name             | Type the IP address or hostname of the primary directory server to use for authentication. The value you type depends on the format of the subject field entry in the directory server's certificate. Typically, this requires a hostname.                                                                                                                                                                                                            |
| -domain           | Type the domain name for the LDAP server.                                                                                                                                                                                                                                                                                                                                                                                                             |
| -protocol         | Specify whether the LDAP protocol uses SSL for secure network communication. SSL provides encryption and authentication capabilities. SSL encrypts data over the network and provides message and server authentication. Value is one of the following: <ul style="list-style-type: none"> <li>ldap — LDAP without SSL.</li> <li>ldaps — LDAP with SSL, which is the default.</li> </ul>                                                              |
| -certFilePath     | Type the path to the trusted certificate file used for one-way server authentication.<br><br><b>Note:</b> If the value of <b>-protocol</b> is ldaps, this qualifier is required.                                                                                                                                                                                                                                                                      |
| -port             | Type the port number used by the directory server for LDAP communications. By default, LDAP uses port 389, and LDAP over an SSL uses port 636.                                                                                                                                                                                                                                                                                                        |
| -bindDn           | Type the base distinguished name (DN) of the root of the LDAP directory tree. The system uses the DN to bind to the LDAP service and determine where in the LDAP directory tree to begin a search for information. The base DN can be expressed as a fully-qualified domain name or in X.509 format by using the attribute dc=.<br>For example, if the fully-qualified domain name is mycompany.com, the base DN is expressed as dc=mycompany,dc=com. |
| -bindPasswd       | If you include the <b>-bindDn</b> qualifier, type the password to be used for binding to the LDAP server.                                                                                                                                                                                                                                                                                                                                             |
| -userSearchPath   | Type the path to search for users on the directory server. For example:<br>ou=People,dc=lss,dc=emc,dc=com<br>On an Active Directory server, a default search path is used.                                                                                                                                                                                                                                                                            |
| -groupSearchPath  | Type the path to search for groups on the directory server. For example:<br>x. uid=<name>,ou=people,dc=<domaincomponent>,or dc=<domain component>.<br>On an Active Directory server, a default search path is used.                                                                                                                                                                                                                                   |
| -userIdAttr       | Type the name of the LDAP attribute whose value indicates the user ID. Default value is uid.                                                                                                                                                                                                                                                                                                                                                          |
| -groupNameAttr    | Type the name of the LDAP attribute whose value indicates the group name. Default value is cn.                                                                                                                                                                                                                                                                                                                                                        |
| -userObjectClass  | Type the LDAP object class for users. Default value is user.<br>In Active Directory, groups and users are stored in the same hierarchical directory path and the class is called group.                                                                                                                                                                                                                                                               |
| -groupObjectClass | Type the LDAP object class for groups. Default value is group.<br>In Active Directory, groups and users are stored in the same directory path and the class is called group.                                                                                                                                                                                                                                                                          |
| -groupMemberAttr  | Type the name of the LDAP attribute whose value contains names of group members within a group. Default value is member.                                                                                                                                                                                                                                                                                                                              |
| -timeout          | Type the timeout for the LDAP server in milliseconds. If the system does not receive a reply from the LDAP server after the specified timeout, it stops sending requests.<br>Default is 30,000 milliseconds, or 30 seconds.                                                                                                                                                                                                                           |

### Example

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /net/ldap create -name
lpso242.lss.emc.com -domain local -port 389 -protocol ldap -bindDn
"cn=Directory Manager" -bindPasswd Password0123 -userSearchPath
"ou=People,dc=lss,dc=emc,dc=com" -groupSearchPath
"ou=Groups,dc=lss,dc=emc,dc=com" -userIdAttr "uid" -groupNameAttr "cn"
-userObjectClass "interOrgPerson" -groupObjectClass "groupOfUniqueNames"
-groupMemberAttr "uniqueMember" -timeout 40000
```

ID = LDAP\_1  
Operation completed successfully.

## View LDAP settings

View details for configured LDAP settings.

**Note:** The [show action command on page 18](#) explains how to change the output format.

### Format

```
/net/ldap [-id <value>] show
```

### Object qualifier

| Qualifier | Description                      |
|-----------|----------------------------------|
| -id       | Type the ID of the LDAP setting. |

### Example

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /net/ldap show
```

```
1: ID = LDAP_1
 Server name = lpso242.lss.emc.com
 Domain = local
 Protocol = ldap
 Port = 389
```

## Change LDAP settings

Update a configured LDAP setting.

### Format

```
/net/ldap -id <value> set -name <value> [-domain <value>] [-port <value>]
[-protocol {ldap|ldaps -certFilePath <value>}] -bindDn <value> -bindPasswd
<value> -userSearchPath <value> [-groupSearchPath <value>] [-userIdAttr
<value>] [-groupNameAttr <value>] [-userObjectClass <value>]
[-groupObjectClass <value>] [-groupMemberAttr <value>] [-timeout <value>]
```

## Object qualifier

| Qualifier | Description                                |
|-----------|--------------------------------------------|
| -id       | Type the ID of the LDAP setting to change. |

## Action qualifiers

| Qualifier        | Description                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| -name            | Type the name for the LDAP server.                                                                                                                                                                                                                                                                                                                                                                                                                 |
| -domain          | Type the domain name for the LDAP server.                                                                                                                                                                                                                                                                                                                                                                                                          |
| -port            | Type the port number used by the directory server for LDAP communications. By default, LDAP uses port 389, and LDAP over an SSL uses port 636.                                                                                                                                                                                                                                                                                                     |
| -protocol        | Type whether the LDAP protocol uses SSL for secure network communication. SSL provides encryption and authentication capabilities. SSL encrypts data over the network and provides message and server authentication. Value is one of the following: <ul style="list-style-type: none"> <li>ldap — LDAP without SSL.</li> <li>ldaps — LDAP with SSL, which is the default.</li> </ul>                                                              |
| -certFilePath    | Type the path to the trusted certificate file used for one-way server authentication.<br><br>Note: If the value of <b>-protocol</b> is ldaps, this qualifier is required.                                                                                                                                                                                                                                                                          |
| -bindDn          | Type the base distinguished name (DN) of the root of the LDAP directory tree. The system uses the DN to bind to the LDAP service and determine where in the LDAP directory tree to begin a search for information. The base DN can be expressed as a fully qualified domain name or in X.509 format using the attribute dc=.<br>For example, if the fully qualified domain name is mycompany.com, the base DN is expressed as dc=mycompany,dc=com. |
| -bindPasswd      | Type the password to be used for binding to the LDAP server. This qualifier is required when the <b>-bindDn</b> qualifier is included.                                                                                                                                                                                                                                                                                                             |
| -userSearchPath  | Type the path to search for users on the directory server. For example:<br>ou=People,dc=ls,dc=emc,dc=com.<br>On an Active Directory server, a default search path is used.                                                                                                                                                                                                                                                                         |
| -groupSearchPath | Type the path to search for groups on the directory server. For example:<br>uid=<name>,ou=people,dc=<domaincomponent>,or dc=<domain component>.<br>On an Active Directory server, a default search path is used.                                                                                                                                                                                                                                   |
| -userIdAttr      | Type the name of the LDAP attribute whose value indicates the user ID. Default value is uid.                                                                                                                                                                                                                                                                                                                                                       |
| -groupNameAttr   | Type the name of the LDAP attribute whose value indicates the group name. Default value is cn.                                                                                                                                                                                                                                                                                                                                                     |
| -userObjectClass | Type the LDAP object class for users. Default value is user.<br>In Active Directory, groups and users are stored in the same hierarchical directory path and the class is called group.                                                                                                                                                                                                                                                            |

| Qualifier         | Description                                                                                                                                                                                                                |
|-------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| -groupObjectClass | Type the LDAP object class for groups. Default value is group.<br>In Active Directory, groups and users are stored in the same directory path and the class is called group.                                               |
| -groupMemberAttr  | Name of the LDAP attribute whose value contains names of group members within a group.<br>Default value is member.                                                                                                         |
| -timeout          | Type the timeout for the LDAP server in milliseconds. If the system does not receive a reply from the LDAP server after the specified timeout, it stops sending requests.<br>Default is 30000 milliseconds, or 30 seconds. |

**Example**

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /net/ldap create -auth
lpaso242 -protocol ldap -server lpso242.lss.emc.com -port 389 -bindDn
"cn=Directory Manager" -bindPasswd Password0123 -userSearchPath
"ou=People,dc=lss,dc=emc,dc=com" -groupSearchPath
"ou=Groups,dc=lss,dc=emc,dc=com" -userIdAttr "uid" -userNameAttr "cn"
-groupNameAttr "cn" -userObjectClass "interOrgPerson" -groupObjectClass
"groupOfUniqueNames" -groupMemberAttr "uniqueMember" -timeout 40000
```

ID = LDAP\_1  
Operation completed successfully.

**Delete LDAP settings**

Delete an LDAP setting.

**Format**

```
/net/ldap -id <value> delete
```

**Object qualifier**

| Qualifier | Description                                |
|-----------|--------------------------------------------|
| -id       | Type the ID of the LDAP setting to delete. |

**Example**

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /net/ldap -id LDAP_1 delete
```

Operation completed successfully.

# 5

## Manage Remote Systems

This chapter addresses the following topics:

|                                                                  |     |
|------------------------------------------------------------------|-----|
| Manage host configurations .....                                 | 104 |
| Manage iSCSI initiators .....                                    | 110 |
| Manage iSCSI CHAP accounts for one-way CHAP authentication ..... | 112 |
| Manage remote storage systems.....                               | 115 |

# Manage host configurations

Hosts are the clients or servers in your network that access storage on the system. Host configurations are logical connections through which hosts or applications can access storage resources. Before a host can access storage, you must define a configuration for it and associate it with a storage resource. Create a host configuration for each host, host subnetwork (subnet), or network group (netgroup) that will access storage resources on the system.

You can create the following types of host configurations:

- ◆ Individual host configurations — Enable you to define and control access to storage resources on a host-by-host basis.
- ◆ Subnet and netgroup configurations — Enable you to define and control access to storage resources for multiple hosts or network segments.

For hosts that will access iSCSI storage, create an iSCSI port to specify the iSCSI initiator settings and assign it to a host configuration. [Manage iSCSI initiators on page 110](#) explains how to configure iSCSI initiators for host configurations.

Each host configuration is identified by an ID.

[Table 24 on page 104](#) lists the attributes for host configurations.

**Table 24    Host configuration attributes**

| Attribute   | Description                                                                                                                                                                                                            |
|-------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ID          | ID of the host configuration.                                                                                                                                                                                          |
| Name        | Name of the host configuration.                                                                                                                                                                                        |
| Description | Brief description of the host configuration.                                                                                                                                                                           |
| Address     | Hostname or IP address associated with the host, IP address of the subnet, or network address of the netgroup.<br><br><b>Note:</b> This information is required when connecting hosts to network shares on the system. |



**Table 24 Host configuration attributes (continued)**

| Attribute | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|-----------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Netmask   | Subnet mask IP address for the host.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Type      | <p>Type of host configuration. Value is one of the following:</p> <ul style="list-style-type: none"> <li>• <b>host</b> — Define and control access to storage resources on a host-by-host basis.</li> <li>• <b>subnet</b> — A subnet is a logical grouping of connected network devices. Devices on a subnet share contiguous ranges of IP addresses. A subnet mask, or network mask, defines the boundaries of an IP subnet.<br/>You can associate a host configuration with a subnet mask to define and control storage access for hosts on a particular network segment.</li> <li>• <b>netgroup</b> — A netgroup is a named sets of hosts, users, or domains on a network. A netgroup can provide a way to reference sets of Linux/UNIX hosts collectively for accessing storage over NFS.<br/>You can create a host configuration for a netgroup to define and control storage access for multiple Linux/UNIX hosts or users through a single configuration.</li> </ul> <p><b>Note:</b> Typically, netgroups are accessible only through NIS. If NIS is not running, netgroups are not defined. <a href="#">Manage NIS server domains on page 91</a> explains how to configure NIS server communication.</p> |
| OS type   | <p>Type of operating system (OS) that runs on the host or netgroup. Value is one of the following:</p> <ul style="list-style-type: none"> <li>• <b>undefined</b> — OS is not specified (default).</li> <li>• <b>other</b> — OS is unknown.</li> <li>• <b>win2003srv</b> — Windows Server 2003.</li> <li>• <b>winxp</b> — Windows XP.</li> <li>• <b>win2008srv</b> — Windows Server 2008.</li> <li>• <b>winvista</b> — Windows Vista.</li> <li>• <b>esx</b> — VMware ESX.</li> <li>• <b>redhat</b> — Red Hat Linux Enterprise.</li> <li>• <b>sles</b> — Suse Linux Enterprise.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |

## Create host configurations

Create a host configuration to establish a connection between the system and hosts that access the system.

### Format

```
/remote/host create -name <value> [-descr <value>] -type {host -addr <value>
[-osType
{undefined|other|win2003srv|winxp|win2008srv|winvista|esx|redhat|sles}} |sub
net -addr <value> -netmask <value>|netgroup -addr <value>}
```

## Action qualifiers

| Qualifier | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|-----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| -name     | Type a name for the host configuration.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| -desc     | Type a brief description of the host configuration.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| -addr     | Type the hostnames or IP addresses associated with the host, IP addresses of the subnet, or the network addresses of the netgroup. Separate each value with a comma.<br><br><b>Note:</b> This information is required when connecting hosts to network shares on the system.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| -type     | Specify the type of host configuration. Value is one of the following: <ul style="list-style-type: none"> <li>• host — A host defines and controls access to storage resources on a host-by-host basis.</li> <li>• subnet — A subnet is a logical grouping of connected network devices. Devices on a subnet share contiguous ranges of IP addresses. A subnet mask, or network mask, defines the boundaries of an IP subnet.<br/>You can associate a host configuration with a subnet mask to define and control storage access for hosts on a particular network segment.</li> <li>• netgroup — A netgroup is a named sets of hosts, users, or domains on a network. A netgroup can provide a way to reference sets of Linux/UNIX hosts collectively for accessing storage over NFS.<br/>You can create a host configuration for a netgroup to define and control storage access for multiple Linux/UNIX hosts or users through a single configuration.</li> </ul> <b>Note:</b> Typically, netgroups are only accessible through NIS. If NIS is not running, netgroups are not defined. <a href="#">Manage NIS server domains on page 91</a> explains how to configure NIS server communication. |
| -netmask  | Type the subnet mask IP address for the host configuration.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| -osType   | Specify the type of operating system (OS) running on the host or netgroup. Value is one of the following: <ul style="list-style-type: none"> <li>• undefined — OS is not specified (default).</li> <li>• other — OS is unknown.</li> <li>• win2003srv — Windows Server 2003.</li> <li>• winxp — Windows XP.</li> <li>• win2008srv — Windows Server 2008.</li> <li>• winvista — Windows Vista.</li> <li>• esx — VMware ESX.</li> <li>• redhat — Red Hat Linux Enterprise.</li> <li>• sles — SUSE Linux Enterprise.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |

### Example 1

The following command creates a host configuration for a host with these settings:

- ◆ Name is MyHost.
- ◆ Description is "accounting."
- ◆ IP address is 10.64.74.10.
- ◆ OS is Windows XP.

The host configuration receives ID 1014:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /remote/host create -name
 MyHost -descr "accounting" -type host -addr 10.64.74.10 -osType winxp
```

```
ID = 1014
```

```
Operation completed successfully.
```

## Example 2

The following command creates a host configuration for a subnet with these settings:

- ◆ Name is MySubnet.
- ◆ Description is "subnet1."
- ◆ IP address is 192.168.10.0.
- ◆ Subnet mask is 255.255.255.0.

The host configuration receives ID 1015:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /remote/host create -name
MySubnet -descr "subnet1" -addr 192.168.10.0 -netmask 255.255.255.0
```

ID = 1015

Operation completed successfully.

## View host configurations

View details about a host configuration. You can filter on the ID of the host configuration or the host type.

**Note:** The [show action command on page 18](#) explains how to change the output format.

### Format

```
/remote/host [{-id <value>|-type {host|subnet|netgroup}}] show
```

### Object qualifier

| Qualifier | Description                                                                      |
|-----------|----------------------------------------------------------------------------------|
| -id       | Type the ID of a host configuration.                                             |
| -type     | Specify the host type. Value is one of the following: host, subnet, or netgroup. |

### Example

The following command lists all host configurations on the system:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /remote/host show
```

```
1: ID = 1014
 Name = Host1
 Description = Accounting
 Type = host
 Address = 10.64.74.10
 Netmask =
 OS type = winxp

2: ID = 1015
 Name = Subnet1
 Description = Testing
 Type = subnet
 Address = 192.168.10.0
 Netmask = 255.255.255.0
 OS type =
```

## Change host configuration settings

Change the settings for a host configuration.

### Format

```
/remote/host -id <value> set [-name <value>] [-descr <value>] [-addr <value>]
[{-netmask <value>|-osType
{undefined|other|win2003srv|winxp|win2008srv|winvista|esx|redhat|sles}}]
```

### Object qualifier

| Qualifier | Description                                      |
|-----------|--------------------------------------------------|
| -id       | Type the ID of the host configuration to change. |

### Action qualifiers

| Qualifier | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|-----------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| -name     | Type a name for the host configuration.                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| -desc     | Type a brief description of the host configuration.                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| -addr     | Type the hostnames or IP addresses associated with the host, IP addresses of the subnet, or the network addresses of the netgroup. Separate each value with a comma.<br><br><b>Note:</b> This information is required when connecting hosts to network shares on the system.                                                                                                                                                                                                                               |
| -netmask  | Type the subnet mask IP address for the host configuration.                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| -osType   | Specify the type of operating system (OS) running on the host or netgroup. Value is one of the following: <ul style="list-style-type: none"> <li>undefined — OS is not specified (default).</li> <li>other — OS is unknown.</li> <li>win2003srv — Windows Server 2003.</li> <li>winxp — Windows XP.</li> <li>win2008srv — Windows Server 2008.</li> <li>winvista — Windows Vista.</li> <li>esx — VMware ESX.</li> <li>redhat — Red Hat Linux Enterprise.</li> <li>sles — SUSE Linux Enterprise.</li> </ul> |

### Example

The following command updates the description of host configuration 1014 to indicate that it now holds the payroll database:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /remote/host -id 1014 set
 -descr "Accounting" -osType winxp
```

ID = 1014

Operation completed successfully.

## Delete host configurations

Delete a host configuration.



### CAUTION

**Deleting a host configuration breaks the iSCSI-based storage connections associated with the configuration. Hosts that use the configuration for NFS-based storage connections, such as NFS shares, revert to the default access privileges for any storage resources that they can access.**

### Format

```
/remote/host -id <value> delete
```

### Object qualifier

| Qualifier | Description                                      |
|-----------|--------------------------------------------------|
| -id       | Type the ID of the host configuration to delete. |

### Example

The following command deletes host configuration 1014:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /remote/host -id 1014 delete
```

Operation completed successfully.

## Manage iSCSI initiators

After you create a host configuration for controlling host access to storage on the system, you need to create an iSCSI initiator for each host configuration that accesses iSCSI storage. The iSCSI initiator represents the initiator on the host, which will connect to the target iSCSI node on the system.

An iSCSI initiator contains a name for the host, its iSCSI address (an iSCSI initiator IQN), and, optionally, the CHAP authentication password associated with the host. [Manage reverse CHAP for mutual CHAP authentication on page 63](#) explains how to configure reverse (two-way) CHAP authentication on the system.

**Note:** You cannot modify an iSCSI initiator. Delete the iSCSI initiator and re-create it with the new settings.

Each iSCSI initiator is identified by an ID.

[Table 25 on page 110](#) lists the attributes for iSCSI initiators.

**Table 25 iSCSI initiator attributes**

| Attribute  | Description                                                                                                                                                                                           |
|------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ID         | ID of the iSCSI port.                                                                                                                                                                                 |
| Host       | ID of the host configuration iSCSI initiator is assigned. <a href="#">Manage host configurations on page 104</a> explains how to configure host configurations for each host connected to the system. |
| IQN        | iSCSI address (initiator IQN) of the iSCSI host, which represents the address of the iSCSI initiator.                                                                                                 |
| CHAP users | ID of the CHAP account configured for the iSCSI initiator that matches the initiator IQN address.                                                                                                     |

## Create iSCSI initiators

Create an iSCSI initiator and assign it to a host configuration for an iSCSI host.

### Format

```
/remote/iscsi/initiator create -host <value> -iqn <value>
```

### Action qualifiers

| Qualifier | Description                                                                                                                                                                                                                   |
|-----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| -host     | Type the ID of the host configuration to which to assign the iSCSI initiator.<br><a href="#">View host configurations on page 107</a> explains how to view the IDs of host configurations on the system.                      |
| -iqn      | Type the iSCSI address (initiator IQN) of the iSCSI host, which represents the address of the iSCSI initiator.<br><b>Note:</b> Once you specify a CHAP secret for a host configuration, you can change it but not disable it. |

### Example

The following command creates an iSCSI initiator for host configuration 1014. The iSCSI initiator receives ID ISCSII\_1:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /remote/iscsi/initiator
create -host 1014 -iqn "iqn.com.emc:14"
```

```
ID = 1014
Operation completed successfully.
```

## View iSCSI initiators

View a list of iSCSI initiators. You can filter on the initiator ID or host ID.

**Note:** The [show action command on page 18](#) explains how to change the output format.

### Format

```
/remote/iscsi/initiator [{-id <value>|-host <value>}] show
```

### Object qualifiers

| Qualifier | Description                                                                                          |
|-----------|------------------------------------------------------------------------------------------------------|
| -id       | Type the ID of an iSCSI initiator.                                                                   |
| -host     | Type the ID of a host configuration to view the iSCSI initiators assigned to the host configuration. |

### Example

The following command lists all iSCSI initiators on the system:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /remote/iscsi/initiator show
```

```
1: ID = HP_1
 Host= 1014
 IQN = iqn.com.emc:14
```

## Delete iSCSI initiators

Delete an iSCSI initiator.



### CAUTION

**Deleting an iSCSI initiator breaks the associated iSCSI-based storage connections. To avoid data loss, ensure that all hosts using the iSCSI initiator have completed all operations before deleting the initiator.**

### Format

```
/remote/iscsi/initiator -id <value> delete
```

### Object qualifier

| Qualifier | Description                                   |
|-----------|-----------------------------------------------|
| -id       | Type the ID of the iSCSI initiator to delete. |

### Example

The following command deletes iSCSI initiator ISCSII\_1:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /remote/iscsi/initiator -id
ISCSII_1 delete
```

Operation completed successfully.

## Manage iSCSI CHAP accounts for one-way CHAP authentication

The system uses a CHAP account to authenticate a host (initiator) attempting to access an iSCSI storage resource (target). CHAP authentication can be one of the following:

- ◆ One-way, where only the target authenticates the initiator. To set one-way CHAP authentication, create a CHAP account for a host configuration that access iSCSI storage.
- ◆ Reverse (also called mutual or two-way), where the target and initiator authenticate each other. Compared to one-way CHAP, enabling reverse CHAP provides an extra level of security. To set reverse CHAP, specify a reverse secret password. [Manage reverse CHAP for mutual CHAP authentication on page 63](#) explains how to configure reverse CHAP authentication.

Each CHAP account is identified by an ID.

[Table 26 on page 112](#) lists the attributes for CHAP accounts.

**Table 26 CHAP Account Attributes**

| Attribute | Description                                                        |
|-----------|--------------------------------------------------------------------|
| ID        | ID of the CHAP account.                                            |
| IQN       | IQN address of the host (initiator).                               |
| Username  | Username that matches the IQN address. Default is the IQN address. |
| Secret    | CHAP secret password.                                              |

## Create iSCSI CHAP accounts

Create an iSCSI CHAP account for a host (initiator).

### Format

```
/remote/iscsi/chap create -iqn <value> -secret <value>
```

### Action qualifiers

| Qualifier | Description                                   |
|-----------|-----------------------------------------------|
| -iqn      | Type the IQN address of the host (initiator). |
| -secret   | Type the CHAP secret password.                |

### Example

The following command creates an iSCSI CHAP account for a host. It receives the ID CHAP\_1:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /remote/iscsi/chap create
-iqn iqn.1991-05.com.microsoft:cpc7745 -secret opqrstuvwxyz
```

ID = CHAP\_1

Operation completed successfully.



## View iSCSI CHAP accounts

View details about iSCSI CHAP accounts on the system.

**Note:** The [show action command on page 18](#) explains how to change the output format.

### Format

```
/remote/iscsi/chap [-id <value>] show
```

### Object qualifier

| Qualifier | Description                           |
|-----------|---------------------------------------|
| -id       | Type the ID of an iSCSI CHAP account. |

### Example

The following command displays all iSCSI CHAP accounts on the system:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /remote/iscsi/chap show
```

```
1: ID = CHAP_1
 IQN = iqn.1991-05.com.microsoft:cpc7745
 Username = iqn.1991-05.com.microsoft:cpc7745
```

## Change iSCSI CHAP account settings

Change the settings for an iSCSI CHAP account, such as the secret password.

### Format

```
/remote/iscsi/chap -id <value> set -secret <value>
```

### Object qualifier

| Qualifier | Description                                      |
|-----------|--------------------------------------------------|
| -id       | Type the ID of the iSCSI CHAP account to change. |

### Action qualifier

| Qualifier | Description                    |
|-----------|--------------------------------|
| -secret   | Type the CHAP secret password. |

### Example

The following command updates the secret password for iSCSI CHAP account CHAP\_1:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /remote/iscsi/chap -id
 CHAP_1 set -secret abcdef123456
```

Operation completed successfully.

## Delete iSCSI CHAP accounts

Delete an iSCSI CHAP account.

**Note:** If you delete an iSCSI CHAP account, the host that used it will no longer be authenticated when attempting to access iSCSI storage.

### Format

```
/remote/iscsi/chap -id <value> delete
```

### Object qualifier

| Qualifier | Description                                |
|-----------|--------------------------------------------|
| -id       | Type the ID of the CHAP account to delete. |

### Example

The following command deletes iSCSI CHAP account CHAP\_1:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /remote/iscsi/chap -id
CHAP_1 delete
```

Operation completed successfully.

## Manage remote storage systems

Configure remote storage systems that connect to the system to which you are logged in. The system uses the configuration to access and communicate with the remote system. For example, to use remote replication, create a configuration that specifies the remote system to use as the destination for the replication session.

Each remote system configuration is identified by an ID.

[Table 27 on page 115](#) lists the attributes for remote storage systems.

**Table 27 Remote system attributes**

| Attribute                 | Description                                                                                                                |
|---------------------------|----------------------------------------------------------------------------------------------------------------------------|
| ID                        | ID of the remote system.                                                                                                   |
| Name                      | Name of the remote system.                                                                                                 |
| Type                      | Type of remote system. Value is VNXe or Celerra.                                                                           |
| Management address        | Network name or management IP address of the remote system.                                                                |
| Source user name          | For VNXe™ systems that are the source in a replication session, the username that is used to access the system.            |
| Source user password      | For VNXe systems that are the source in a replication session, the user password that is used to access the system.        |
| Destination user name     | For VNXe systems that are the destination in a replication session, the username that is used to access the system.        |
| Destination user password | For VNXe systems that are the destination in a replication session, the user password that is used to access the system.   |
| Passphrase                | For Celerra systems, the passphrase that is used between the source and destination systems in the replication connection. |

## Create remote system configurations

Configure a remote system configuration for the local system to access.

### Format

```
/remote/sys create -type {VNXe -srcUsername <value> -srcPassword <value>
 -dstUsername <value> -dstPassword <value>|Celerra -name <value> -passPhrase
 <value>} -addr <value>
```

## Action qualifiers

| Qualifier    | Description                                                                                                                   |
|--------------|-------------------------------------------------------------------------------------------------------------------------------|
| -name        | For EMC Celerra® systems, type the name of the Control Station.                                                               |
| -addr        | Type the network name or IP address of the remote system.                                                                     |
| -type        | Specify the remote system type. Value is VNXe or Celerra.                                                                     |
| -srcUsername | For VNXe systems that are the source in a replication session, type the username that is used to access the system.           |
| -srcPassword | For VNXe systems that are the source in a replication session, type the user password that is used to access the system.      |
| -dstUsername | For VNXe systems that are the destination in a replication session, type the username that is used to access the system.      |
| -dstPassword | For VNXe systems that are the destination in a replication session, type the user password that is used to access the system. |
| -passPhrase  | Type the passphrase that is used between the source and destination systems in the replication connection.                    |

### Example

The following command creates a remote system configuration with these settings:

- ◆ Name is Remote1.
- ◆ Type is VNXe.
- ◆ Network address is 10.64.75.10.
- ◆ Includes access credentials for when the system is the source or destination.
- ◆ IP address is 10.64.75.10.

The configure remote system receives the ID RS\_1:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /remote/sys create -name
 "Remote1" -type vnx -srcUsername admin1 -srcPassword Password456!
 -dstUsername admin2 -dstPassword Password986! -addr "10.64.75.10"
```

```
ID = RS_1
```

```
Operation completed successfully.
```

## Verify settings for remote storage systems

Verify the configuration settings for a remote system to ensure that the source storage resource can connect to the remote storage resource.

### Format

```
/remote/sys -id <value> verify
```

## Object qualifier

| Qualifier | Description                                                          |
|-----------|----------------------------------------------------------------------|
| -id       | Type the ID of a remote system configuration to verify the settings. |

### Example

The following command verifies remote system configuration RS\_1:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /remote/sys -id RS_1 verify
```

Operation completed successfully.

## View settings for remote storage systems

View the configuration for a remote system on the local system. You can filter on the configuration ID of the remote system.

**Note:** The [show action command on page 18](#) explains how to change the output format.

### Format

```
/remote/sys [-id <value>] show
```

## Object qualifier

| Qualifier | Description                                   |
|-----------|-----------------------------------------------|
| -id       | Type the ID of a remote system configuration. |

### Example

The following command lists all configurations for remote storage systems:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /remote/sys show
```

```
1: ID = RS_1
 Name = Celerra1
 Address = 10.64.74.1
 Type = Celerra

2: ID = RS_2
 Name = Celerra2
 Address = 10.64.74.2
 Type = Celerra
```

## Change settings for remote storage systems

Change the configuration settings for a remote system.

### Format

```
/remote/sys -id <value> set [-name <value>] [-addr <value>] [-dstUsername
 <value> -dstPassword <value>] [-passPhrase <value>]
```

### Object qualifier

| Qualifier | Description                                               |
|-----------|-----------------------------------------------------------|
| -id       | Type the ID of the remote system configuration to change. |

### Action qualifiers

| Qualifier    | Description                                                                                                                   |
|--------------|-------------------------------------------------------------------------------------------------------------------------------|
| -name        | For Celerra systems, type the name of the system.                                                                             |
| -addr        | Type the network name or management IP address of the remote system.                                                          |
| -dstUsername | For VNXe systems that are the destination in a replication session, type the username that is used to access the system.      |
| -dstPassword | For VNXe systems that are the destination in a replication session, type the user password that is used to access the system. |
| -passPhrase  | Type the passphrase that is used between the source and destination systems in the replication connection.                    |

### Example

The following command changes the name, IP address, and access credentials for remote system configuration RS\_1:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /remote/sys -id RS_1 set
 -name "Remote2" -addr "10.64.74.2" -dstUsername Local/joe -dstPassword
 Password456!
```

ID = RS\_1

Operation completed successfully.

## Delete remote system configurations

Delete the configuration for a remote system.



### CAUTION

**Before deleting a remote system configuration, ensure that all I/O operations on the system, such as active replication sessions, have completed to avoid data loss.**

### Format

```
/remote/sys -id <value> delete
```

**Object qualifier**

| Qualifier | Description                                               |
|-----------|-----------------------------------------------------------|
| -id       | Type the ID of the remote system configuration to delete. |

**Example**

The following command deletes remote system configuration RS\_1:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /remote/sys -id RS_1 delete
```

Operation completed successfully.





# 6

## Manage Storage

This chapter addresses the following topics:

|                                              |     |
|----------------------------------------------|-----|
| Configure storage pools automatically .....  | 122 |
| Configure custom storage pools .....         | 124 |
| View storage profiles .....                  | 130 |
| Manage disk groups .....                     | 133 |
| View local storage pools .....               | 136 |
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| Manage VMware NFS datastores .....           | 167 |
| Manage VMware VMFS datastores .....          | 176 |
| Manage data deduplication .....              | 182 |

## Configure storage pools automatically

Storage pools are the groups of disks, called disk groups, on which you create storage resources. The system can automatically configure storage pools by selecting the appropriate disk groups based on the type and availability of disks in the system. [Configure custom storage pools on page 124](#) explains how to configure custom storage pools.

**Note:** Before you create storage resources, you must configure at least one storage pool.

[Table 28 on page 122](#) lists the attributes for automatic pool configuration.

**Table 28 Automatic pool configuration attributes**

| Attribute        | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Target           | Type of disk configuration. Value is one of the following: <ul style="list-style-type: none"> <li>pool — Disks configured in a pool.</li> <li>spares — Disks assigned to storage pools as spares. The number of spares assigned to a pool is dependent on the disk type and pool type: <ul style="list-style-type: none"> <li>For Capacity pools, no spare disks are assigned.</li> <li>For Performance pools, a spare disk is assigned for the first 0–30 disks, and then another spare disk is assigned for every group of thirty disks after that.</li> <li>For Flash pools, a spare disk is assigned for the first 0–30 disks, and then another spare disk is assigned for every group of thirty disks after that.</li> </ul> </li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Name             | Name of the pool. The system allocates disks to one or more of the following pools based on the types and characteristics of the disks on the system: <ul style="list-style-type: none"> <li>Capacity — Storage allocated from near-line (NL) serial attached SCSI (SAS) disks. Provides high-capacity storage, but with lower overall performance to regular SAS and Enterprise Flash Drive (EFD) disks. Use NL SAS disks to provide extremely economical storage for operations, such as data backup, that do not require high I/O performance.</li> <li>Performance — Storage allocated from serial attached SCSI (SAS) disks. Provides medium performance and medium capacity storage for applications that require balance of performance and capacity.</li> <li>Flash — Storage allocated from EFD disks. Extremely high level performance, but at a relatively high cost per GB of storage. EFDs are most applicable to applications that require high I/O performance and energy efficiency.</li> </ul> Depending on the pool type, the system configures the disks into different RAID groups and assigns disks to pools as spares. The Unisphere online help provides more details about storage pools and spares. |
| Drives (current) | List of disks currently in the pool.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Drives (new)     | List of disks to be added to the pool.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |

## Initiate automatic storage pool configuration

Start configuring storage pools automatically. [View configuration settings for automatic storage pool creation on page 123](#) displays the configuration settings that the system will apply when you run this command.

### Format

```
/stor/config/auto set
```

### Example

The following command initiates automatic storage pool configuration:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /stor/config/auto set
```

Operation completed successfully.

## View configuration settings for automatic storage pool creation

View the settings for automatic storage pool creation that will be applied to the system. [Initiate automatic storage pool configuration on page 122](#) explains how to apply these settings to the system.

**Note:** The [show action command on page 18](#) explains how to change the output format.

### Format

```
/stor/config/auto show
```

### Example

The following command shows how storage pools and spares will be configured automatically on the system:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /stor/config/auto show
```

```
1: Target = Pool
 Name = Performance
 Drives (current) = 6 x 600GB SAS; 6 x 300GB SAS
 Drives (new) = 3 x 600GB SAS

2: Target = Pool
 Name = Capacity
 Drives (current) = 10 x 1TB FAT-SAS
 Drives (new) = 2 x 1TB FAT-SAS

3: Target = Pool
 Name = Flash
 Drives (current) = 10 x 100GB EFD
 Drives (new) = 10 x 100GB EFD

4: Target = Spares
 Drives (current) = 1 x 600GB SAS; 1 x 300GB SAS; 1 x 1TB FAT-SAS
 Drives (new) = 1 x 100GB EFD
```

## Configure custom storage pools

Storage pools are the groups of disks on which you create storage resources. Configure storage pools based on the type of storage resource and usage that will be associated with the pool, such as shared folder storage optimized for database usage. The storage characteristics differ according to the following:

- ◆ Type of disk used to provide the storage.
- ◆ RAID level implemented for the storage.

**Note:** Before you create storage resources, you must configure at least one storage pool.

[Configure storage pools automatically on page 122](#) explains how to have the system configure storage pools automatically.

[Table 29 on page 124](#) lists the attributes for storage pools.

**Table 29 Custom storage pool attributes**

| Attribute               | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|-------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ID                      | ID of the storage pool.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Name                    | Name of the storage pool.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Description             | Brief description of the storage pool.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Total space             | Total storage capacity of the storage pool.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Current allocation      | Amount of storage in the storage pool allocated to storage resources.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Remaining space         | Amount of storage in the storage pool not allocated to storage resources.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Subscription            | For thin provisioning, the total storage space subscribed to the storage pool.<br>All storage pools support both standard and thin provisioned storage resources. For standard storage resources, the entire requested size is allocated from the pool when the resource is created, for thin provisioned storage resources only incremental portions of the size are allocated based on usage. Because thin provisioned storage resources can subscribe to more storage than is actually allocated to them, storage pools can be over provisioned to support more storage capacity than they actually possess.<br>The system automatically generates an alert when the total pool usage reaches 85% of the pool's physical capacity. <b>-alertThreshold</b> specifies the alert threshold value. |
| Subscription percent    | For thin provisioning, the percentage of the total space in the storage pool that is subscription storage space.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Alert threshold         | Threshold for the system to send an alert when hosts have consumed a specific percentage of the subscription space. Value range is 50 to 85.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Drives                  | List of the types of disks on the system, including the number of disks of each type, in the storage pool.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Number of drives        | Total number of disks in the storage pool.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Number of unused drives | Number of disks in the storage pool that are not being used.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| RAID level              | RAID level of the disks in the storage pool.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Stripe length           | Number of disks the data is striped across.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |

**Table 29 Custom storage pool attributes (continued)**

| Attribute            | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|----------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| System defined pool  | Indication of whether the system configured the pool automatically. Value is yes or no.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Health state         | <p>Health state of the storage pool. The health state code appears in parentheses. Value is one of the following:</p> <ul style="list-style-type: none"> <li>Unknown (0) — Health is unknown.</li> <li>OK (5) — Operating normally.</li> <li>Degraded/Warning (10) — Pool is operating, but degraded due to one or more of the following: <ul style="list-style-type: none"> <li>Pool has exceeded the user-specified threshold.</li> <li>Pool is nearing capacity.</li> <li>Pool is almost full.</li> <li>Pool performance has degraded.</li> </ul> </li> <li>Major failure (20) — Dirty cache has made the pool unavailable.</li> <li>Critical failure (25) — Pool is full. To avoid data loss, add more storage to the pool, or create more pools.</li> <li>Non-recoverable error (30) — Two or more disks in the pool have failed, possibly resulting in data loss.</li> </ul> |
| Recommended resource | Recommended storage resource type and storage usage type for the pool.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |

## Configure storage pools

Configure a storage pool.

### Format

```
/stor/config/pool create -name <value> [-descr <value>] -storProfile <value>
-diskGroup <value> -drivesNumber <value> [-alertThreshold <value>]
[-resType {exchange|sf|vmware|iscsi|hyperv} -usage
{general|database|backup|datastore|exchange07|exchange10}]
```

## Action qualifiers

| Qualifier       | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|-----------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| -name           | Type a name for the storage pool.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| -descr          | Type a brief description of the storage pool.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| -storProfile    | Type the ID of the storage profile to apply to the storage pool, based on the type of storage resource that will use the pool and the intended usage of the pool.<br><a href="#">View storage profiles on page 130</a> explains how to view the IDs of available storage profiles on the system.                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| -diskGroup      | Type the ID of the disk group to use in the storage pool.<br><a href="#">View disk groups on page 133</a> explains how to view the IDs of the disk groups on the system.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| -drivesNumber   | Specify the number of disks from the selected disk group to use in the storage pool.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| -alertThreshold | For thin provisioning, specify the threshold, as a percentage, when the system will alert on the amount of subscription space used. When hosts consume the specified percentage of subscription space, the system sends an alert. Value range is 50% to 85%.                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| -resType        | Specify the type of storage resource that will use the storage pool. Value is one of the following: <ul style="list-style-type: none"> <li>• exchange — Microsoft Exchange storage.</li> <li>• sf — Shared folder storage.</li> <li>• vmware — VMware datastore storage.</li> <li>• iscsi — Generic iSCSI storage.</li> <li>• hyperv — Microsoft Hyper-V storage.</li> </ul>                                                                                                                                                                                                                                                                                                                                                               |
| -usage          | Specify how the storage resource, specified for <b>-resType</b> , will use the storage pool. Value is one of the following: <ul style="list-style-type: none"> <li>• general — General use. Supported storage resource types are generic iSCSI and shared folder.</li> <li>• database — Store a database. Supported storage resource types are generic iSCSI and shared folder.</li> <li>• backup — Back up data. Supported storage resource types are generic iSCSI and shared folder.</li> <li>• datastore — Store virtual machines. Supported storage resource types are VMware and Hyper-V.</li> <li>• exchange07 — Store data for Microsoft Exchange 2007.</li> <li>• exchange10 — Store data for Microsoft Exchange 2010.</li> </ul> |

### Example

The following command creates a storage pool that uses storage profile SP\_1 and seven disks from disk group DG\_1. The configured storage pool receives ID SPL\_4:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /stor/config/pool create
 -name GlobalPool1 -descr "Oracle databases" -storProfile SP_1 -diskGroup
 DG_1 -drivesNumber 7
```

```
ID = SPL_4
Operation completed successfully.
```

## View storage pools

View a list of storage pools. You can filter on the storage pool ID.

**Note:** [The show action command on page 18](#) explains how to change the output format.

### Format

```
/stor/config/pool [-id <value>] show
```

**Object qualifier**

| Qualifier | Description                    |
|-----------|--------------------------------|
| -id       | Type the ID of a storage pool. |

**Example**

The following command shows details about all storage pools on the system:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /stor/config/pool show
-detail
```

```
1: ID = SPL_1
 Name = Performance
 Description =
 Total space = 4947802324992 (4.5TB)
 Current allocation = 3298534883328 (3TB)
 Remaining space = 4947802324992 (1.5TB)
 Subscription = 10995116277760 (10TB)
 Subscription percent = 222%
 Alert threshold = 70%
 Drives = 6 x 600GB SAS; 6 x 300GB SAS
 Number of drives = 12
 Unused drives = 3
 RAID level = 5
 System defined pool = yes
 Health state = OK (5)
 Recommended resource = VMware - General

2: ID = SPL_2
 Name = Capacity
 Description =
 Total space = 4947802324992 (4.5TB)
 Current allocation = 3298534883328 (3TB)
 Remaining space = 4947802324992 (1.5TB)
 Subscription = 10995116277760 (10TB)
 Subscription percent = 222%
 Alert threshold = 70%
 Drives = 12 x 2TB FAT-SAS
 Number of drives = 12
 Unused drives = 7
 RAID level = 6
 System defined pool = yes
 Health state = OK (5)
 Recommended resource = VMware - Database
```

**Change storage pool settings**

Change the subscription alert threshold setting for a storage pool.

**Format**

```
/stor/config/pool -id <value> set -alertThreshold <value>
```

**Object qualifier**

| Qualifier | Description                                |
|-----------|--------------------------------------------|
| -id       | Type the ID of the storage pool to change. |

**Action qualifier**

| Qualifier       | Description                                                                                                                                                                                                                                                  |
|-----------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| -alertThreshold | For thin provisioning, specify the threshold, as a percentage, when the system will alert on the amount of subscription space used. When hosts consume the specified percentage of subscription space, the system sends an alert. Value range is 50% to 85%. |

**Example**

The following command sets the subscription alert threshold for storage pool SPL\_1 to 70%:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /stor/config/pool -id SPL_1
 -alertThreshold 70
```

Operation completed successfully.

**Add disks to storage pools**

Add new disks to a storage pool to increase its storage capacity.

**Format**

```
/stor/config/pool -id <value> extend -diskGroup <value> -drivesNumber <value>
```

**Object qualifier**

| Qualifier | Description                                |
|-----------|--------------------------------------------|
| -id       | Type the ID of the storage pool to extend. |

**Action qualifiers**

| Qualifier     | Description                                                                        |
|---------------|------------------------------------------------------------------------------------|
| -diskGroup    | Type the ID of the disk group to add to the storage pool.                          |
| -drivesNumber | Type the number of disks from the specified disk group to add to the storage pool. |

**Example**

The following command extends storage pool SPL\_1 with seven disks from disk group DG\_1:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /stor/config/pool -id SPL_1
 extend -diskGroup DG_1 -drivesNumber 7
```

Operation completed successfully.



## Recycle unused disks from storage pools

Recycle groups of disks in a storage pool that the pool is not currently using. When you recycle the disks, the system locates unused disks and removes them from the pool. The disks are then available for configuring a separate pool.

**Note:** If you remove all disks from a storage pool, the pool is removed and must be re-created.

### Format

```
/stor/config/pool [-id <value>] recycle
```

### Object qualifier

| Qualifier | Description                                                                                                                                                                                                        |
|-----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| -id       | Type the ID of the storage pool from which to remove unused disks.<br><br><b>Note:</b> If you do not include this qualifier to specify a storage pool, the system will remove unused disks from all storage pools. |

### Example

The following command removes unused disks from storage pool SPL\_1:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /stor/config/pool -id SPL_1
recycle
```

Operation completed successfully.

## View storage profiles

Storage profiles are preconfigured settings for configuring storage pools based on the following:

- ◆ Types of storage resources that will use the pools.
- ◆ Intended usage of the pool.

For example, create a storage pool for shared folder storage resources intended for general use. When configuring a storage pool, specify the ID of the storage profile to apply to the pool.

**Note:** Storage profiles are not restrictive with regard to storage provisioning. For example, you can provision shared folders from a generic iSCSI database storage pool. However, the characteristics of the storage will be best suited to the indicated storage resource type and use.

Each storage profile is identified by an ID.

[Table 30 on page 130](#) lists the attributes for storage profiles.

**Table 30 Storage profile attributes**

| Attribute        | Description                                                                                                                                                                                                                               |
|------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ID               | ID of the storage profile.                                                                                                                                                                                                                |
| Description      | Brief description of the storage profile.                                                                                                                                                                                                 |
| Drive type       | Types of disks for the storage profile.                                                                                                                                                                                                   |
| RAID level       | RAID level number for the storage profile. Value is one of the following: <ul style="list-style-type: none"> <li>• 1 — RAID level 1.</li> <li>• 5 — RAID level 5.</li> <li>• 6 — RAID level 6.</li> <li>• 10 — RAID level 1+0.</li> </ul> |
| Maximum capacity | Maximum storage capacity for the storage profile.                                                                                                                                                                                         |
| Stripe length    | Number of disks the data is striped across.                                                                                                                                                                                               |

**Note:** [The show action command on page 18](#) explains how to change the output format.

### Format

```
/stor/config/profile [-id <value>] show
```

### Object qualifier

| Qualifier | Description                       |
|-----------|-----------------------------------|
| -id       | Type the ID of a storage profile. |

**Example**

The following command shows details for all storage profiles on the system:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /stor/config/profile show
```

```
1: ID = SP_1
 Description = Best Performance
 Drive type = SAS
 RAID level = 5
 Maximum capacity = 1099511627776 (1TB)
 Stripe length = 6

2: ID = SP_2
 Description = High Capacity
 Drive type = FAT-SAS
 RAID level = 6
 Maximum capacity = 2199023255520 (20TB)
 Stripe length = 6

3: ID = SP_3
 Name = Performance
 Drive type = SAS
 RAID level = 5
 Maximum capacity = 5937362789990 (5.4TB)
 Stripe length = 5
```

**View recommended storage profiles**

View the recommended storage profiles to apply to a storage pool based on the type of storage resource that will use the pool and the intended use.

**Note:** The [show action command on page 18](#) explains how to change the output format.

**Format**

```
/stor/config/profile recom -resType {exchange|sf|vmware|iscsi|hyperv} -usage
{general|database|backup|datastore|exchange07|exchange10}
```

## Action qualifiers

| Qualifier | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|-----------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| -resType  | Specify the type of storage resource that will use the storage pool. Value is one of the following: <ul style="list-style-type: none"> <li>• exchange — Microsoft Exchange storage.</li> <li>• sf — Shared folder storage.</li> <li>• vmware — VMware datastore storage.</li> <li>• iscsi — Generic iSCSI storage.</li> <li>• hyperv — Microsoft Hyper-V storage.</li> </ul>                                                                                                                                                                                                                                                                                                                                                          |
| -usage    | Specify how the storage resource, specified for <b>-reType</b> , will use the storage pool. Value is one of the following: <ul style="list-style-type: none"> <li>• general — General use. Supported storage resource types are generic iSCSI and shared folder.</li> <li>• database — Store a database. Supported storage resource types are generic iSCSI and shared folder.</li> <li>• backup — Back up data. Supported storage resource types are generic iSCSI and shared folder.</li> <li>• datastore — Store virtual machines. Supported storage resource types are VMware and Hyper-V.</li> <li>• exchange07—Store data for Microsoft Exchange 2007.</li> <li>• exchange10—Store data for Microsoft Exchange 2010.</li> </ul> |

### Example

The following command shows the recommended storage profiles to apply to a storage pool that will be used for general purposes to store generic iSCSI data:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /stor/config/profile recom
-resType generic -usage general
```

```
1: ID = SP_1
 Ranking = 3
 Description = Best Performance
 Drive type = SAS
 RAID level = 5
 Maximum capacity = 4398046511104 (4TB)
 Stripe length = 6

2: ID = SP_2
 Ranking = 2
 Description = High Capacity
 Drive type = FAT-SAS
 RAID level = 6
 Maximum capacity = 13194139533312 (12TB)
 Stripe length = 6

3: ID = SP_3
 Ranking = 1
 Description = Performance
 Drive type = EFD
 RAID level = 5
 Maximum capacity = 107374182400 (100GB)
 Stripe length = 5
```

## Manage disk groups

Disk groups are the groups of disks on the system with similar characteristics, including type, capacity, and spindle speed. When configuring storage pools, you select the disk group to use and the number of disks from the group to add to the pool.

Each disk group is identified by an ID.

Table 31 on page 133 lists the attributes for disk groups.

**Table 31 Disk group attributes**

| Attribute                    | Description                                                             |
|------------------------------|-------------------------------------------------------------------------|
| ID                           | ID of the disk group.                                                   |
| Drive type                   | Type of disks in the disk group.                                        |
| Drive size                   | Capacity of one disk in the disk group.                                 |
| Number of drives             | Total number of disks in the disk group.                                |
| Unconfigured drives          | Total number of disks in the disk group that are not in a storage pool. |
| Capacity                     | Total capacity of all disks in the disk group.                          |
| Number of spares             | Total number of disks in the disk group reserved as spares.             |
| Recommended number of spares | Number of spares recommended for the disk group.                        |
| Allowed number of spares     | Range of the number of spares allowed for the disk group.               |

## View disk groups

View details about disk groups on the system. You can filter on the disk group ID.

**Note:** The [show action command on page 18](#) explains how to change the output format.

### Format

```
/stor/config/dg [-id <value>] show
```

### Object qualifier

| Qualifier | Description                  |
|-----------|------------------------------|
| -id       | Type the ID of a disk group. |

### Example

The following command shows details about all disk groups:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /stor/config/dg show
```

```
1: ID = DG_1
 Drive type = FAT-SAS
 Drive size = 536870912000 (500GB)
 Number of drives = 21
 Unconfigured drives = 7
 Capacity = 11544872091648 (10.5TB)
 Number of spares = 0
```

```
Recommended number of spares = 1
Allowed number of spares = 0-7

2: ID = DG_2
 Drive type = FAT-SAS
 Drive size = 1099511627776 (1TB)
 Number of drives = 14
 Unconfigured drives = 0
 Capacity = 15393162788864 (14TB)
 Number of spares = 1
 Recommended number of spares = 1
 Allowed number of spares = 0-1

3: ID = DG_3
 Drive type = SAS
 Drive size = 107374182400 (100GB)
 Number of drives = 10
 Unconfigured drives = 3
 Capacity = 1099511627776 (1TB)
 Number of spares = 0
 Recommended number of spares = 1
 Allowed number of spares = 0-3
```

## Add spares to disk groups

Change the number of spare disks in a disk group.

### Format

```
/stor/config/dg -id <value> set -spares <value>
```

### Object qualifier

| Qualifier | Description                              |
|-----------|------------------------------------------|
| -id       | Type the ID of the disk group to change. |

### Action qualifier

| Qualifier | Description                                                      |
|-----------|------------------------------------------------------------------|
| -spares   | Type the number of disks in the disk group to reserve as spares. |

### Example

The following command reserves two spares in disk group DG\_1:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /stor/config/dg -id DG_1 set
 -spares 2
```

Operation completed successfully.

## View recommended disk group configurations

View the recommended disk groups from which to add disks to a storage pool based on a specified storage profile or pool type.

**Note:** The [show action command on page 18](#) explains how to change the output format.

### Format

```
/stor/config/dg recom {-profile <value>|-pool <value>}
```

### Action qualifiers

| Qualifier | Description                                                                                                                      |
|-----------|----------------------------------------------------------------------------------------------------------------------------------|
| -profile  | Type the ID of a storage profile. The output will include the list of disk groups recommended for the specified storage profile. |
| -pool     | Type the ID of a storage pool. The output will include the list of disk groups recommended for the specified storage pool.       |

### Example

The following command shows the recommended disk groups for storage profile SPL\_1:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /stor/config/dg recom
-pool SPL_1
```

```
1: ID = DG_1
 Drive type = SAS
 Drive size = 536870912000 (500GB)
 Number of drives = 8
 Allowed numbers of drives = 4,8
 Capacity = 4398046511104 (4TB)

2: ID = DG_2
 Drive type = SAS
 Drive size = 268435456000 (250GB)
 Number of drives = 4
 Allowed numbers of drives = 4
 Capacity = 1099511627776 (1TB)
```

## View local storage pools

View details about local storage pools. A local storage pool is storage that is:

- ◆ Reserved from a storage pool for a storage resource, such as a shared folder or generic iSCSI storage.
- ◆ Provisioned to an SP.

You can see the relationship between the local storage pool and the SP that it is using, including the capacity size of the pool.

Table 32 on page 136 lists the attributes for local storage pools.

**Table 32 Local storage pool attributes**

| Attribute | Description                                                          |
|-----------|----------------------------------------------------------------------|
| Name      | Name of the pool.                                                    |
| SP        | Name of the SP on which the pool is configured. Value is SPA or SPB. |
| Size      | Capacity size of the pool.                                           |

**Note:** The [show action command on page 18](#) explains how to change the output format.

### Format

```
/stor/prov/pool [-sp {a|b}] show
```

### Object qualifier

| Qualifier | Description                              |
|-----------|------------------------------------------|
| -sp       | Type the name of an SP. Value is a or b. |

### Example

The following command displays details about local storage pools for both SPs:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /stor/prov/pool show
```

```
1: Name = Performance
 SP = SPA
 Size = 1319413953331 (1.2TB)

2: Name = Performance
 SP = SPB
 Size = 1099511627776 (1TB)

3: Name = Capacity
 SP = SPA
 Size = 5937362789990 (5.4TB)

4: Name = Capacity
 SP = SPB
 Size = 3518437208883 (3.2TB)

5: Name = Flash
 SP = SPA
 Size = 214748364800 (200GB)
```



## View supported storage resources

View a list of the storage resources you can create on the system.

Table 33 on page 137 lists the attributes for storage resources.

**Table 33 Storage resource attributes**

| Attribute | Description                                                                                                                                                                                    |
|-----------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ID        | ID of the storage resource.                                                                                                                                                                    |
| Name      | Name of the storage resource. Value is one of the following: <ul style="list-style-type: none"> <li>Shared Folders — Shared folder storage.</li> <li>iSCSI — Generic iSCSI storage.</li> </ul> |
| Vendor    | Name of the vendor associated with the storage resource.                                                                                                                                       |
| Version   | Version of the storage resource.                                                                                                                                                               |
| License   | Feature license associated with the storage resource.                                                                                                                                          |

**Note:** The [show action command on page 18](#) explains how to change the output format.

### Format

```
/stor/prov/sr show
```

### Example

The following command lists all storage resources supported on the system:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /stor/prov/sr show
```

```
1: ID = sf
 Name = Files & Shared Folders
 Vendor = EMC
 Version = v1.0
 License = FFFF-FFFF-FFFF-AAAA

2: ID = iscsi
 Name = Generic Storage
 Vendor = EMC
 Version = 10.1.0.5
 License = FFFF-FFFF-FFFF-BBBB
```

## Manage shared folders

Shared folders are logical containers on the system that provide file-based storage resources to hosts. You configure shared folders on Shared Folder Servers, which maintain and manage filesystems for the shared folders. You create network shares on the shared folder, which connected hosts map or mount to access the shared folder storage. When creating a shared folder, you can enable support for the following network shares:

- ◆ Common Internet File System (CIFS) shares, which provide storage access to Windows hosts.
- ◆ Network file system (NFS) shares, which provide storage access to Linux/UNIX hosts.

Each shared folder is identified by an ID.

[Table 34 on page 138](#) lists the attributes for shared folders.

**Table 34 Shared folder attributes**

| Attribute    | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|--------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ID           | ID of the shared folder.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Name         | Name of the shared folder.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Description  | Description of the shared folder.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| Health state | <p>Health state of the shared folder. The health state code appears in parentheses. Value is one of the following:</p> <ul style="list-style-type: none"> <li>• OK (5) — Shared folder is operating normally.</li> <li>• Degraded/Warning (10) — Working, but one or more of the following may have occurred:               <ul style="list-style-type: none"> <li>- One or more of its storage pools are degraded.</li> <li>- Its replication session is degraded.</li> <li>- Its replication session has faulted.</li> <li>- It has almost reached full capacity. Increase the primary storage size, or create additional shared folders to store your data, to avoid data loss. <a href="#">Change shared folder settings on page 144</a> explains how to change the primary storage size.</li> </ul> </li> <li>• Minor failure (15) — One or both of the following may have occurred:               <ul style="list-style-type: none"> <li>- One or more of its storage pools have failed</li> <li>- The associated Shared Folder Server has failed.</li> </ul> </li> <li>• Major failure (20) — One or both of the following may have occurred:               <ul style="list-style-type: none"> <li>- One or more of its storage pools have failed.</li> <li>- Shared folder is unavailable.</li> </ul> </li> <li>• Critical failure (25) — One or more of the following may have occurred:               <ul style="list-style-type: none"> <li>- One or more of its storage pools are unavailable.</li> <li>- Shared folder is unavailable.</li> <li>- Shared folder has reached full capacity. Increase the primary storage size, or create additional shared folders to store your data, to avoid data loss. <a href="#">Change shared folder settings on page 144</a> explains how to change the primary storage size.</li> </ul> </li> <li>• Non-recoverable error (30) — One or both of the following may have occurred:               <ul style="list-style-type: none"> <li>- One or more of its storage pools are unavailable.</li> <li>- Shared folder is unavailable.</li> </ul> </li> </ul> |
| Server name  | Name of the primary Shared Folder Server that the shared folder uses.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Storage pool | Name of the storage pool that the shared folder uses.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Protocol     | <p>Protocol used to enable network shares from the shared folder. Values is one of the following:</p> <ul style="list-style-type: none"> <li>• nfs — Protocol for Linux/UNIX hosts.</li> <li>• cifs — Protocol for Windows hosts.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |

**Table 34 Shared folder attributes (continued)**

| Attribute                     | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|-------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Size                          | Quantity of storage reserved for primary data.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Size used                     | Quantity of storage currently used for primary data.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| Maximum size                  | Maximum size to which you can increase the primary storage capacity.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| Thin provisioning enabled     | <p>Indication of whether thin provisioning is enabled. Value is yes or no. Default is no. All storage pools support both standard and thin provisioned storage resources. For standard storage resources, the entire requested size is allocated from the pool when the resource is created, for thin provisioned storage resources only incremental portions of the size are allocated based on usage. Because thin provisioned storage resources can subscribe to more storage than is actually allocated to them, storage pools can be over provisioned to support more storage capacity than they actually possess. The Unisphere online help provides more details on thin provisioning.</p>                                                                                                                                 |
| Current allocation            | If enabled, the quantity of primary storage currently allocated through thin provisioning.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Protection size               | Quantity of storage reserved for protection data.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Protection size used          | Quantity of storage currently used for protection data.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Protection current allocation | If thin provisioning is enabled, the quantity of protection storage currently allocated through thin provisioning.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Maximum protection size       | Maximum size to which you can increase protection storage capacity.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Auto-adjust protection size   | <p>Indication of whether auto-adjust protection is enabled. Value is yes or no. This feature automatically adjusts the size of the protection storage in proportion with changes to the size of the primary storage.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Protection schedule           | <p>ID of an applied protection schedule.</p> <p><a href="#">View protection schedules on page 48</a> explains how to view the IDs of schedules on the system.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Protection schedule paused    | Indication of whether an applied protection schedule is currently paused. Value is yes or no.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| File level retention          | <p>Indication of whether file-level retention (FLR) is enabled. Value is yes or no. FLR provides a way to set file-based permissions to limit write access to the files for a specific period of time. In this way, file-level retention can ensure the integrity of data during that period by creating an unalterable set of files and directories.</p> <p><b>Note:</b> File-level retention prevents files from being modified or deleted by NAS clients and users. Once you enable FLR for a Windows shared folder, you cannot disable it. Leave FLR disabled unless you intend to implement self-regulated archiving and you intend the administrator to be the only trusted user of the shared folder on which FLR is enabled.</p> <p>The Unisphere online help and the host documentation provide more details on FLR.</p> |

**Table 34 Shared folder attributes (continued)**

| Attribute               | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|-------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| CIFS synchronous write  | <p>Indication of whether CIFS synchronous writes option is enabled. Value is yes or no.</p> <p>The CIFS synchronous writes option provides enhanced support for applications that store and access database files on Windows network shares. On most CIFS filesystems read operations are synchronous and write operations are asynchronous. When you enable the CIFS synchronous writes option for a Windows (CIFS) shared folder, the system performs immediate synchronous writes for storage operations, regardless of how the CIFS protocol performs write operations.</p> <p>Enabling synchronous write operations allows you to store and access database files (for example, MySQL) on CIFS network shares. This option guarantees that any write to the share is done synchronously and reduces the chances of data loss or file corruption in various failure scenarios, for example, loss of power.</p> <p><b>Note:</b> Do not enable CIFS synchronous writes unless you intend to use the Windows shared folders to provide storage for database applications.</p> <p>The Unisphere online help provides more details on CIFS synchronous write.</p> |
| CIFS oplocks            | <p>Indication of whether opportunistic file locks (oplocks) for CIFS network shares are enabled. Value is yes or no.</p> <p>Oplocks allow CIFS clients to buffer file data locally before sending it to a server. CIFS clients can then work with files locally and periodically communicate changes to the system, rather than having to communicate every operation to the system over the network.</p> <p>This feature is enabled by default for Windows (CIFS) shared folders. Unless your application handles critical data or has specific requirements that make this mode or operation unfeasible, leave oplocks enabled.</p> <p>The Unisphere online help provides more details on CIFS oplocks.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| CIFS notify on write    | <p>Indication of whether write notifications for CIFS network shares are enabled. Value is yes or no.</p> <p>When enabled, Windows applications receive notifications each time a user writes or changes a file on the CIFS share.</p> <p><b>Note:</b> If this option is enabled, the value for CIFS directory depth indicates the lowest directory level to which the notification setting applies.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| CIFS notify on access   | <p>Indication of whether file access notifications for CIFS shares are enabled. Value is yes or no.</p> <p>When enabled, Windows applications receive notifications each time a user accesses a file on the CIFS share.</p> <p><b>Note:</b> If this option is enabled, the value for CIFS directory depth indicates the lowest directory level to which the notification setting applies.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| CIFS directory depth    | <p>For write and access notifications on CIFS network shares, the subdirectory depth permitted for file notifications. Value range is 1–512. Default is 512.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Replication destination | <p>Indication of whether the shared folder is a destination for a replication session (local or remote). Value is yes or no.</p> <p><a href="#">Manage replication sessions on page 192</a> explains how to configure replication sessions on the system.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Deduplication enabled   | <p>Indication of whether deduplication is enabled on the shared folder. Value is yes or no.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Creation time           | <p>Date and time when the shared folder was created.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Last modified time      | <p>Date and time when the shared folder settings were last changed.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |

## Create shared folders

Create an NFS shared folder or CIFS shared folder. You must create a shared folder for each type of share (NFS or CIFS) you plan to create. Once you create a shared folder, create the NFS or CIFS network shares and use the ID of shared folder to associate it with a share.

**Note:** [Size qualifiers on page 17](#) provides details on using size qualifiers to specify a storage size.

### Prerequisites

- ◆ Configure at least one storage pool for the shared folder to use and allocate at least one storage disk to the pool. [Configure storage pools automatically on page 122](#) explains how to create pools on the system automatically and [Configure custom storage pools on page 124](#) explains how to create custom pools.
- ◆ Configure at least one Shared Folder Server to which to associate the shared folder. [Create Shared Folder Servers on page 59](#) explains how to configure Shared Folder Servers.

### Format

```
/stor/prov/sf/res create -name <value> [-replDest {yes|no}] [-desc <value>]
 -server <value> -pool <value> -size <value> [-thin {yes|no}] -type {cifs
 [-cifsSyncWrites {yes|no}] [-cifsOpLocks {yes|no}] [-cifsNotifyOnWrite
 {yes|no}] [-cifsNotifyOnAccess {yes|no}] [-cifsNotifyDirDepth <value>]|nfs}
 [-fileLevelRet {yes|no}] [-protSize <value>] [-autoProtAdjust {yes|no}]
 [-sched <value> [-schedPaused {yes|no}]]
```

## Action qualifiers

| Qualifier           | Description                                                                                                                                                                                                                                        |
|---------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| -name               | Type a name for the shared folder.                                                                                                                                                                                                                 |
| -replDest           | Specify to make the shared folder the destination of a replication session (local or remote). Value is yes or no.                                                                                                                                  |
| -descr              | Type a brief description of the shared folder.                                                                                                                                                                                                     |
| -server             | Type the ID of the Shared Folder Server that will be the primary storage server for the shared folder. <a href="#">View Shared Folder Servers on page 60</a> explains how to view the IDs of the Shared Folder Servers on the system.              |
| -pool               | Type the name of the storage pool that the shared folder will use.<br><br><b>Note:</b> Value is case-sensitive.<br><br><a href="#">View storage pools on page 126</a> explains how to view the IDs of the storage pools on the system.             |
| -size               | Type the amount of storage in the pool to reserve for the shared folder. <a href="#">Storage resource size limitations on page 230</a> explains the limitations on storage size.                                                                   |
| -thin               | Enable thin provisioning on the shared folder. Value is yes or no. Default is no.                                                                                                                                                                  |
| -type               | Specify the type of network shares to export from the shared folder. Value is one of the following: <ul style="list-style-type: none"> <li>nfs — Network shares for Linux/UNIX hosts.</li> <li>cifs — Network shares for Windows hosts.</li> </ul> |
| -cifsSyncWrites     | Enable synchronous write operations for CIFS network shares. Value is yes or no. Default is no.                                                                                                                                                    |
| -cifsOpLocks        | Enable opportunistic file locks (oplocks) for CIFS network shares. Value is yes or no. Default is yes.                                                                                                                                             |
| -cifsNotifyOnWrite  | Enable to receive notifications when users write to a CIFS share. Value is yes or no. Default is no.                                                                                                                                               |
| -cifsNotifyOnAccess | Enable to receive notifications when users access a CIFS share. Value is yes or no. Default is no.                                                                                                                                                 |
| -cifsNotifyDirDepth | If the value for <b>-cifsNotifyOnWrite</b> or <b>-cifsNotifyOnAccess</b> is yes (enabled), specify the subdirectory depth to which the notifications will apply. Value range is within range 1–512. Default is 512.                                |
| -fileLevelRet       | Enable file-level retention on the shared folder. Values is yes or no. Default is no.                                                                                                                                                              |
| -protSize           | Type the amount of protection storage to allocate for the shared folder.                                                                                                                                                                           |
| -sched              | Type the ID of the schedule to apply to the shared folder. <a href="#">View protection schedules on page 48</a> explains how to view the IDs of the schedules on the system.                                                                       |
| -schedPaused        | Pause the schedule specified for the <b>-sched</b> qualifier. Value is yes or no. Default is no.                                                                                                                                                   |
| -autoProtAdjust     | Specify whether the protection size, entered for the <b>-protSize</b> qualifier, is automatically adjusted in proportion with changes to the size of the primary storage. Value is yes or no.                                                      |

### Example

The following command creates a shared folder with these settings:

- ◆ Named SharedFolder01.
- ◆ Description of “NFS shares.”
- ◆ Uses the capacity storage pool.
- ◆ Uses Shared Folder Server SFS\_1 as the primary storage server.
- ◆ Primary storage size is 100 MB.

- ◆ Supports NFS network shares.
- ◆ Protection size is 200 MB.

The shared folder receives the ID SF\_1:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /stor/prov/sf/res create
 -name SharedFolder01 -descr "NFS shares" -pool capacity -server SFS_1 -size
 100MB -type nfs -protSize 200MB
```

ID = SF\_1

Operation completed successfully.

## View shared folders

View details about a shared folder. You can filter on the shared folder ID.

**Note:** The [show action command on page 18](#) explains how to change the output format.

### Format

```
/stor/prov/sf/res [-id <value>|-remSys <value>] show
```

### Object qualifiers

| Qualifiers | Description                                                            |
|------------|------------------------------------------------------------------------|
| -id        | Type the ID of a shared folder.                                        |
| -remSys    | Type the ID of a remote system to view the shared folders that use it. |

### Example

The following command lists details about all shared folders on the system:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /stor/prov/sf/res show
```

```
1: ID = SF_1
 Name = MySF
 Description = my shared folder resource
 Health state = OK (5)
 Server = SFS_1
 Storage pool = Performance
 Protocol = nfs
 Size = 1099511627776 (1TB)
 Size used = 128849018880 (120GB)
 Protection size = 2199023255552 (2TB)
 Protection size used = 1099511627776 (1TB)
 Deduplication enabled = no
```

## Change shared folder settings

Change the settings for a shared folder.

**Note:** [Size qualifiers on page 17](#) explains how to use the size qualifiers when specifying a storage size.

### Format

```
/stor/prov/sf/res -id <value> set [-name <value>] [-descr <value>] [-size
<value>] [-thin {yes|no}] [-cifsSyncWrites {yes|no}] [-cifsOpLocks
{yes|no}] [-cifsNotifyOnWrite {yes|no}] [-cifsNotifyOnAccess {yes|no}]
[-cifsNotifyDirDepth {yes|no}] [-protSize <value>] [-autoProtAdjust
{yes|no}] [-sched <value>] [-schedPaused {yes|no}]
```

### Object qualifier

| Qualifier | Description                                 |
|-----------|---------------------------------------------|
| -id       | Type the ID of the shared folder to change. |

### Action qualifiers

| Qualifier           | Description                                                                                                                                                                                                                                                                                              |
|---------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| -name               | Type a name for the shared folder.                                                                                                                                                                                                                                                                       |
| -descr              | Type a brief description of the shared folder.                                                                                                                                                                                                                                                           |
| -size               | Type the amount of storage in the pool to reserve for the shared folder.<br><a href="#">Storage resource size limitations on page 230</a> explains the limitations on storage size.                                                                                                                      |
| -thin               | Enable thin provisioning on the shared folder. Value is yes or no. Default is no.                                                                                                                                                                                                                        |
| -currentAlloc       | If thin provisioning is enabled for the shared folder, specify the amount of storage to allocate for primary data. This value is the lowest value to which you can set the primary storage size. You cannot decrease the current allocation value, but you can increase it up to the current size value. |
| -cifsSyncWrites     | Enable synchronous write operations for CIFS network shares. Value is yes or no. Default is no.                                                                                                                                                                                                          |
| -cifsOpLocks        | Enable opportunistic file locks (oplocks) for CIFS network shares. Value is yes or no. Default is yes.                                                                                                                                                                                                   |
| -cifsNotifyOnWrite  | Enable to receive notifications when users write to a CIFS share. Value is yes or no. Default is no.                                                                                                                                                                                                     |
| -cifsNotifyOnAccess | Enable to receive notifications when users access a CIFS share. Value is yes or no. Default is no.                                                                                                                                                                                                       |
| -cifsNotifyDirDepth | If the value for <b>-cifsNotifyOnWrite</b> or <b>-cifsNotifyOnAccess</b> is yes (enabled), specify the subdirectory depth to which the notifications will apply. Value range is 1–512. Default is 512.                                                                                                   |
| -protSize           | Type the amount of protection storage to allocate for the shared folder.                                                                                                                                                                                                                                 |
| -sched              | Type the ID of the schedule to apply to the shared folder.<br><a href="#">View protection schedules on page 48</a> explains how to view the IDs of the schedules on the system.                                                                                                                          |
| -schedPaused        | Pause the schedule specified for the <b>-sched</b> qualifier. Value is yes or no (default).                                                                                                                                                                                                              |
| -autoProtAdjust     | Specify whether the protection size, entered for the <b>-protSize</b> qualifier, is automatically adjusted in proportion with changes to the size of the primary storage. Value is yes or no.                                                                                                            |



### Example

The following command enables thin provisioning on shared folder SF\_1:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /stor/prov/sf/res -id SF_1
set -vpEnabled yes
```

ID = SF\_1

Operation completed successfully.

## Delete shared folders

Delete a shared folder.



### CAUTION

**Deleting a shared folder removes all network shares and snapshots associated with the shared folder from the system. After the shared folder is deleted, the files and folders inside it cannot be restored from snapshots. Back up the data from a shared folder before deleting it from the system.**

### Format

```
/stor/prov/sf/res [-id <value>] delete
```

### Object qualifier

| Qualifier | Description                                 |
|-----------|---------------------------------------------|
| -id       | Type the ID of the shared folder to delete. |

### Example

The following command deletes shared folder SF\_1:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /stor/prov/sf/res -id SF_1
delete
```

Operation completed successfully.

## Manage NFS network shares

Network file system (NFS) network shares use the NFS protocol to provide an access point for configured Linux/UNIX hosts, or IP subnets, to access shared folder storage. NFS network shares are associated with an NFS shared folder.

Each NFS share is identified by an ID.

[Table 35 on page 146](#) lists the attributes for NFS network shares.

**Table 35 NFS network share attributes**

| Attribute        | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ID               | ID of the share.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Name             | Name of the share.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Description      | Brief description of the share.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| Local path       | Name of the directory on the system where the share resides.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Export path      | Export path, used by hosts to connect to the share.<br>The export path is a combination of the name of the associated Shared Folder Server and the name of the share.                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Resource         | ID of the shared folder associated with the share. <a href="#">View NFS share settings on page 148</a> explains how to view the IDs of the NFS network shares on the system.                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Default access   | Default share access settings for host configurations and for unconfigured hosts that can reach the share. Value is one of the following: <ul style="list-style-type: none"> <li>ro — Read-only access to primary storage and snapshots associated with the share.</li> <li>rw — Read/write access to primary storage and snapshots associated with the share.</li> <li>root — Read/write root access to primary storage and snapshots associated with the share. This includes the ability to set access controls that restrict the permissions for other login accounts.</li> <li>na — No access to the share or its snapshots.</li> </ul> |
| Read-only hosts  | ID of each host that has read-only permission to the share and its snapshots.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Read/write hosts | ID of each host that has read/write permissions to the share and its snapshots.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| Root hosts       | ID of each host that has root permission to the share and its snapshots.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| No access hosts  | ID of host that has no access to the share or its snapshots.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |

## Create NFS network shares

Create an NFS share to export a shared folder through the NFS protocol.

### Prerequisite

Configure a shared folder to which to associate the NFS network shares. [Create shared folders on page 141](#) explains how to create shared folders on the system.

### Format

```
/stor/prov/sf/nfs create -name <value> [-descr <value>] -res <value> -path
 <value> [-defAccess {ro|rw|root|na}] [-roHosts <value>] [-rwHosts <value>]
 [-rootHosts <value>] [-naHosts <value>]
```

## Action qualifiers

| Qualifier  | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| -name      | <p>Type a name for the share.</p> <p><b>Note:</b> This value, along with the name of the Shared Folder Server, constitutes the export path by which hosts access the share.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| -descr     | Type a brief description of the share.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| -res       | Type the ID of the NFS shared folder to associate with the share. <a href="#">View shared folders on page 143</a> explains how to view the IDs of the shared folders on the system.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| -path      | <p>Type a name for the directory on the system where the share will reside. This path must correspond to an existing directory/folder name within the share that was created from the host-side.</p> <p>Each share must have a unique local path. The system automatically creates this path for the initial share created when you create the shared folder.</p> <p>Before you can create additional network shares within an NFS shared folder, you must create network shares within it from a Linux/UNIX host that is connected to the shared folder. After a share has been created from a mounted host, you can create a corresponding share on the system and set access permissions accordingly.</p> |
| -defAccess | <p>Specify the default share access settings for host configurations and for unconfigured hosts that can reach the share. Value is one of the following:</p> <ul style="list-style-type: none"> <li>• ro — Read-only access to primary storage and snapshots associated with the share.</li> <li>• rw — Read/write access to primary storage and snapshots associated with the share.</li> <li>• root — Read/write root access to primary storage and snapshots associated with the share. This includes the ability to set access controls that restrict the permissions for other login accounts.</li> <li>• na — No access to the share or its snapshots.</li> </ul>                                      |
| -roHosts   | <p>Type the ID of each host configuration you want to grant read-only permission to the share and its snapshots. Separate each ID with a comma.</p> <p>For host configurations of type 'host,' by default, all of the host's IP addresses can access the share and its snapshots. To allow access to only specific IPs, type those specific IPs in square brackets after the host ID. For example: ID[IP,IP], where 'ID' is a host configuration ID and 'IP' is an IP address.</p> <p><a href="#">View host configurations on page 107</a> explains how to view the ID of each host configuration.</p>                                                                                                       |
| -rwHosts   | <p>Type the ID of each host configuration you want to grant read-write permission to the share and its snapshots. Separate each ID with a comma.</p> <p>For host configurations of type 'host,' by default, all of the host's IP addresses can access the share and its snapshots. To allow access to only specific IPs, type those specific IPs in square brackets after the host ID. For example: ID[IP,IP], where 'ID' is a host configuration ID and 'IP' is an IP address..</p> <p><a href="#">View host configurations on page 107</a> explains how to view the ID of each host configuration.</p>                                                                                                     |
| -rootHosts | <p>Type the ID of each host configuration you want to grant root permission to the share and its snapshots. Separate each ID with a comma.</p> <p>For host configurations of type 'host,' by default, all of the host's IP addresses can access the share and its snapshots. To allow access to only specific IPs, type those specific IPs in square brackets after the host ID. For example: ID[IP,IP], where 'ID' is a host configuration ID and 'IP' is an IP address..</p> <p><a href="#">View host configurations on page 107</a> explains how to view the ID of each host configuration.</p>                                                                                                           |
| -naHosts   | <p>Type the ID of each host configuration you want to block access to the share and its snapshots. Separate each ID with a comma.</p> <p>For host configurations of type 'host,' by default, all of the host's IP addresses cannot access the share and its snapshots. To limit access for specific IPs, type the IPs in square brackets after the host ID. For example: ID[IP,IP], where 'ID' is a host configuration ID and 'IP' is an IP address.</p> <p><a href="#">View host configurations on page 107</a> explains how to view the ID of each host configuration.</p>                                                                                                                                 |

## Example

The following command creates an NFS share with these settings:

- ◆ Name is NFSshare.
- ◆ Description is "My share."
- ◆ Associated to shared folder SF\_1.
- ◆ Local path on the system is directory nfsshare.
- ◆ Host HOST\_1 has read-only permissions to the share and its snapshots.
- ◆ Hosts HOST\_2 and HOST\_3 have read and write access to the share and its snapshots.

The share receives ID NFS\_1:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /stor/prov/sf/nfs create
 -name NFSshare -descr "My share" -res SF_1 -path "nfsshare" -roHosts HOST_1
 -rwHosts "HOST_2,HOST_3"
```

ID = NFS\_1

Operation completed successfully.

## View NFS share settings

View details of an NFS share. You can filter on the NFS share ID or view the NFS network shares associated with a shared folder ID.

**Note:** The [show action command on page 18](#) explains how to change the output format.

### Format

```
/stor/prov/sf/nfs [{-id <value>|-res <value>}] show
```

### Object qualifiers

| Qualifier | Description                                                                    |
|-----------|--------------------------------------------------------------------------------|
| -id       | Type the ID of an NFS share.                                                   |
| -res      | Type the ID of an NFS shared folder to view the associated NFS network shares. |

### Example

The following command lists details for all NFS network shares on the system:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /stor/prov/sf/nfs show
```

```
1: ID = NFS_1
 Name = MyNFSshare1
 Description = My nfs share
 Resource = SF_1
 Local path = nfsshare1
 Export path = 10.64.75.10/MyNFSshare1

2: ID = NFS_2
 Name = MyNFSshare2
 Description = This is my second share
 Resource = SF_1
 Local path = nfsshare2
 Export path = 10.64.75.10/MyNFSshare2
```

## Change NFS share settings

Change the settings of an NFS share.

### Format

```
/stor/prov/sf/nfs -id <value> set [-descr <value>] [-defAccess
 {ro|rw|root|na}] [-roHosts <value>] [-rwHosts <value>] [-rootHosts <value>]
 [-naHosts <value>]
```

## Object qualifier

| Qualifier | Description                                                                                                                                                         |
|-----------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| -id       | Type the ID of an NFS share to change.<br><a href="#">View NFS share settings on page 148</a> explains how to view the IDs of the NFS network shares on the system. |

## Action qualifiers

| Qualifier  | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| -descr     | Type a brief description of the share.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| -defAccess | Specify the default share access settings for host configurations and for unconfigured hosts who can reach the share. Value is one of the following: <ul style="list-style-type: none"> <li>ro — Read-only access to primary storage and snapshots associated with the share.</li> <li>rw — Read/write access to primary storage and snapshots associated with the share.</li> <li>root — Read/write root access to primary storage and snapshots associated with the share. This includes the ability to set access controls that restrict the permissions for other login accounts.</li> <li>na — No access to the share or its snapshots.</li> </ul> |
| -roHosts   | Type the ID of each host configuration you want to grant read-only permission to the share and its snapshots. Separate each ID with a comma.<br>For host configurations of type 'host,' by default, all of the host's IP addresses can access the share and its snapshots. To allow access to only specific IPs, type those specific IPs in square brackets after the host ID. For example: ID[IP,IP], where 'ID' is a host configuration ID and 'IP' is an IP address..<br><a href="#">View host configurations on page 107</a> explains how to view the ID of each host configuration.                                                                |
| -rwHosts   | Type the ID of each host configuration you want to grant read-write permission to the share and its snapshots. Separate each ID with a comma.<br>For host configurations of type 'host,' by default, all of the host's IP addresses can access the share and its snapshots. To allow access to only specific IPs, type those specific IPs in square brackets after the host ID. For example: ID[IP,IP], where 'ID' is a host configuration ID and 'IP' is an IP address..<br><a href="#">View host configurations on page 107</a> explains how to view the ID of each host configuration.                                                               |
| -rootHosts | Type the ID of each host configuration you want to grant root permission to the share and its snapshots. Separate each ID with a comma.<br>For host configurations of type 'host,' by default, all of the host's IP addresses can access the share and its snapshots. To allow access to only specific IPs, type those specific IPs in square brackets after the host ID. For example: ID[IP,IP], where 'ID' is a host configuration ID and 'IP' is an IP address..<br><a href="#">View host configurations on page 107</a> explains how to view the ID of each host configuration.                                                                     |
| -naHosts   | Type the ID of each host configuration you want to block access to the share and its snapshots. Separate each ID with a comma.<br>For host configurations of type 'host,' by default, all of the host's IP addresses cannot access the share and its snapshots. To limit access for specific IPs, type the IPs in square brackets after the host ID. For example: ID[IP,IP], where 'ID' is a host configuration ID and 'IP' is an IP address.<br><a href="#">View host configurations on page 107</a> explains how to view the ID of each host configuration.                                                                                           |

## Example

The following command changes NFS share NFS\_1 to block access to the share and its snapshots for host HOST\_1:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /stor/prov/sf/nfs -id NFS_1
set -descr "My share" -naHosts "HOST_1"
```

```
ID = NFS_1
Operation completed successfully.
```

## Delete NFS network shares

Delete an NFS share.



### CAUTION

**Deleting a share removes any files and folders associated with the share from the system. You cannot use snapshots to restore the contents of a share. Back up the data from a share before deleting it from the system.**

### Format

```
/stor/prov/sf/nfs -id <value> delete
```

### Object qualifier

| Qualifier | Description                                                                                                                                                         |
|-----------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| -id       | Type the ID of an NFS share to change.<br><a href="#">View NFS share settings on page 148</a> explains how to view the IDs of the NFS network shares on the system. |

### Example

The following command deletes NFS share NFS\_1:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /stor/prov/sf/nfs -id NFS_1 delete
```

Operation completed successfully.

## Manage CIFS network shares

CIFS network shares use the CIFS protocol to provide an access point for configured Windows hosts to access shared folder storage. The system uses Active Directory to authenticate user and user group access to the share. CIFS network shares are associated with a CIFS shared folder.

Each CIFS share is identified by an ID.

[Table 36 on page 152](#) lists the attributes for CIFS network shares.

**Table 36 CIFS network share attributes**

| Attribute   | Description                                                                                                                                                                  |
|-------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ID          | ID of the share.                                                                                                                                                             |
| Name        | Name of the share.                                                                                                                                                           |
| Description | Brief description of the share.                                                                                                                                              |
| Local path  | Name of the directory on the system where the share resides.                                                                                                                 |
| Export path | Export path, used by hosts to connect to the share.<br>The export path is a combination of the name of the associated Shared Folder Server and the name of the share.        |
| Resource    | ID of the shared folder associated with the CIFS share.<br><a href="#">View shared folders on page 143</a> explains how to view the IDs of the shared folders on the system. |

## Create CIFS network shares

Create a CIFS share to export a shared folder through the CIFS protocol.

### Prerequisite

Configure a shared folder to which to associate the CIFS network shares. [Create shared folders on page 141](#) explains how to configure shared folders on the system.

### Format

```
/stor/prov/sf/cifs create -name <value> [-descr <value>] -res <value> -path
 <value>
```



## Action qualifiers

| Qualifier | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|-----------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| -name     | Type a name for the share.<br><br><b>Note:</b> This value, along with the Shared Folder Server name, constitutes the export path by which hosts access the share.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| -descr    | Type a brief description of the share.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| -res      | Type the ID of the shared folder to associate with the CIFS share.<br><a href="#">View shared folders on page 143</a> explains how to view the IDs of the shared folders on the system.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| -path     | Type a name for the directory on the system where the share will reside.<br>CIFS shared folders allow you to create multiple network shares with the same local path. You can specify different host-side access controls for different users, but the network shares within the shared folder will all access common content.<br>If you want the CIFS network shares within the same shared folder to access different content, you must first create the network shares within the shared folder from a Windows host that is mapped to the shared folder. After the additional network shares are created from a Windows host, you can create corresponding network shares in Unisphere CLI. |

### Example

The following command creates a CIFS share with these settings:

- ◆ Name is CIFSshare.
- ◆ Description is "My share."
- ◆ Associated to shared folder SF\_1.
- ◆ Local path on the system is directory cifsshare.

The CIFS share receives ID CIFS\_1:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /stor/prov/sf/cifs create
 -name CIFSshare -descr "My share" -res SF_1 -path "cifsshare"
```

```
ID = CIFS_1
Operation completed successfully.
```

## View CIFS network shares

View details about CIFS network shares. You can filter on the CIFS share ID or view the network shares associated with a CIFS shared folder ID.

**Note:** [The show action command on page 18](#) explains how to change the output format.

### Format

```
/stor/prov/sf/cifs [{-id <value>|-res <value>}] show
```

## Object qualifiers

| Qualifier | Description                                                                     |
|-----------|---------------------------------------------------------------------------------|
| -id       | Type the ID of a CIFS share.                                                    |
| -res      | Type the ID of a CIFS shared folder to view the associated CIFS network shares. |

### Example

The following command lists all CIFS network shares on the system:

```
/stor/prov/sf/cifs show
```

```

1: ID = CIFS_1
 Name = MyCIFSshare1
 Description = my CIFS share
 Resource = SF_1
 Local path = cifshare1
 Export path = \\10.64.75.10\MyCIFSshare1

2: ID = CIFS_2
 Name = MyCIFSshare2
 Description = Read-only share
 Resource = SFS_1
 Local path = cifshare2
 Export path = \\10.64.75.10\MyCIFSshare2

```

## Change CIFS share settings

Change the description of a CIFS share.

### Format

```
/stor/prov/sf/cifs -id <value> set -descr <value>
```

### Object qualifier

| Qualifier | Description                              |
|-----------|------------------------------------------|
| -id       | Type the ID of the CIFS share to change. |

### Action qualifier

| Qualifier | Description                            |
|-----------|----------------------------------------|
| -descr    | Type a brief description of the share. |

### Example

The following command changes the description of CIFS share CIFS\_1:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /stor/prov/sf/cifs -id CIFS_1 set -descr "My new description"
```

```
ID = CIFS_1
Operation completed successfully.
```

## Delete CIFS network shares

Delete a CIFS share.



### CAUTION

**Deleting a share removes any files and folders associated with the share from the system. You cannot use snapshots to restore the contents of a share. Back up the data from a share before deleting it from the system.**

### Format

```
/stor/prov/sf/cifs -id <value> delete
```

### Object qualifier

| Qualifier | Description                              |
|-----------|------------------------------------------|
| -id       | Type the ID of the CIFS share to delete. |

### Example

The following command deletes CIFS share CIFS\_1:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! uemcli /stor/prov/sf/cifs
-id CIFS_1 delete
```

Operation completed successfully.

## Manage generic iSCSI storage resources

Generic iSCSI storage resources provide hosts and applications with raw block storage that they can access over network connections. Hosts access iSCSI storage resources through virtual disks. A virtual disk reserves a specific quantity of storage resources for a specific host. When the host connects to the virtual disk, it can format the virtual disk appropriately, and then use it like a local storage device.

The system organizes generic iSCSI storage into the following categories:

- ◆ iSCSI storage resource — A container for iSCSI storage associated with a particular host.
- ◆ Virtual disk — An individual instance of generic iSCSI storage associated with a specific quantity and pool of storage, and referenced by a particular logical unit identifier (LUN).

Generic iSCSI storage resources can contain one or more virtual disks. When you configure host access to a generic iSCSI storage resource, the specified access extends to all virtual disks within the storage resource.

[Table 37 on page 156](#) lists the attributes for iSCSI storage resources.

**Table 37 Generic iSCSI storage attributes**

| Attribute      | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|----------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ID             | ID of the storage resource.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Name           | Name of the storage resource.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Description    | Brief description of the storage resource.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Health state   | <p>Health state of the storage resource. The health state code appears in parentheses. Value is one of the following:</p> <ul style="list-style-type: none"> <li>• OK (5) — Resource is operating normally.</li> <li>• Degraded/Warning (10) — Working, but one or more of the following may have occurred:               <ul style="list-style-type: none"> <li>- One or more of its storage pools are degraded.</li> <li>- Its replication session is degraded.</li> <li>- Its replication session has faulted.</li> <li>- It has almost reached full capacity. Increase the primary storage size, or create additional resources to store your data, to avoid data loss. <a href="#">Change iSCSI storage resources on page 159</a> explains how to increase the primary storage size.</li> </ul> </li> <li>• Minor failure (15) — One or both of the following may have occurred:               <ul style="list-style-type: none"> <li>- One or more of its storage pools have failed.</li> <li>- The associated iSCSI node has failed.</li> </ul> </li> <li>• Major (20) — One or both of the following may have occurred:               <ul style="list-style-type: none"> <li>- Resource is unavailable.</li> <li>- One or more of the associated storage pools have failed.</li> </ul> </li> <li>• Critical failure (25) — One or more of the following may have occurred:               <ul style="list-style-type: none"> <li>- One or more of its storage pools are unavailable.</li> <li>- Resource is unavailable.</li> <li>- Resource has reached full capacity. Increase the primary storage size, or create additional resources to store your data, to avoid data loss. <a href="#">Change iSCSI storage resources on page 159</a> explains how to increase the primary storage size.</li> </ul> </li> <li>• Non-recoverable error (30) — One or both of the following may have occurred:               <ul style="list-style-type: none"> <li>- Resource is unavailable.</li> <li>- One or more of the associated storage pools are unavailable.</li> </ul> </li> </ul> |
| Node           | Name of the iSCSI node to which the storage resource is associated.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| iSCSI target   | iSCSI address (IQN) of the associated iSCSI node.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Total capacity | Total primary capacity allocated to the storage resource.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |

**Table 37 Generic iSCSI storage attributes (continued)**

| Attribute                                  | Description                                                                                                                                                                                                                                 |
|--------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Total current allocation                   | Total storage currently allocated to all virtual disks.                                                                                                                                                                                     |
| Total protection size                      | Total protection capacity allocated to the storage resource.                                                                                                                                                                                |
| Total protection size used                 | Total protection capacity allocated to the storage resource that is currently used by protection data, such as snapshots.                                                                                                                   |
| Auto-adjust protection size                | Indication of whether the auto-adjust protection storage feature is enabled. Value is yes or no. The auto-adjust protection feature automatically adjusts the protection storage size in proportion to changes to the primary storage size. |
| Protection schedule                        | ID of a protection schedule applied to the storage resource.<br><a href="#">View protection schedules on page 48</a> explains how to view the IDs of the schedules on the system.                                                           |
| Protection schedule paused                 | Indication of whether an applied protection schedule is currently paused.                                                                                                                                                                   |
| Virtual disk access hosts iSCSI initiators | List of hosts with access permissions to the virtual disks. Each host displays the host identifier followed by a comma-separated list of host IQNs enclosed in square brackets.                                                             |
| Snapshots access host iSCSI initiators     | List of hosts with access permissions to the snapshots. Each host displays the host identifier followed by a comma-separated list of host IQNs enclosed in square brackets.                                                                 |
| Replication destination                    | Indication of whether the storage resource is a destination in a replication session. Value is yes or no.                                                                                                                                   |

## Create iSCSI storage resources

Create an iSCSI storage resource. Once you create the storage resource, create the virtual disks that hosts use to access the storage.

### Prerequisites

- ◆ Configure at least one storage pool for the generic iSCSI storage resource to use and allocate at least one storage disk to the pool. [Configure storage pools automatically on page 122](#) explains how to create storage pools automatically on the system and [Configure custom storage pools on page 124](#) explains how to create a custom storage pool on the system.
- ◆ Configure at least one iSCSI node to which to associate the generic iSCSI storage resource. [Create iSCSI nodes on page 68](#) explains how to create iSCSI nodes on the system.

### Format

```
/stor/prov/iscsi/res create -name <value> [-descr <value>] -node <value>
[-replDest {yes|no}] [-autoProtAdjust {yes|no}] [-sched <value>
[-schedPaused {yes|no}]] [-vdiskHosts <value>] [-snapHosts <value>]
```

## Action qualifiers

| Qualifier       | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|-----------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| -name           | Type a name for the storage resource.<br><br><b>Note:</b> Use a name that reflects the type and version of the application that will use it, which can facilitate how the storage resource is managed and monitored through Unisphere.                                                                                                                                                                                                                                                                                                                     |
| -descr          | Type a brief description of the storage resource.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| -node           | Type the ID of the iSCSI node to which to associate the storage resource.<br><a href="#">View iSCSI nodes on page 68</a> to view the IDs of the iSCSI nodes on the system.                                                                                                                                                                                                                                                                                                                                                                                 |
| -replDest       | Specify whether the storage resource is a destination in a replication session. Value is yes or no.                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| -autoProtAdjust | Specify whether the auto-adjust protection storage feature is enabled. Value is yes or no.<br>The auto-adjust protection feature automatically adjusts the protection storage size in proportion to changes to the primary storage size.                                                                                                                                                                                                                                                                                                                   |
| -sched          | Type the ID of a protection schedule to apply to the storage resource.<br><a href="#">View protection schedules on page 48</a> explains how to view the IDs of the schedules on the system.                                                                                                                                                                                                                                                                                                                                                                |
| -schedPaused    | Specify whether to pause the protection schedule specified for <b>-sched</b> . Value is yes or no.                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| -vdiskHosts     | Type the ID of each host configuration to give access to the virtual disks associated with the storage resource. Separate each ID with a comma.<br>By default, all iSCSI initiators on the host can access all virtual disks. To allow access for specific initiators, type the IQN of each initiator in square brackets after the host ID. For example: ID[IQN,IQN], where 'ID' is a host configuration ID and 'IQN' is an initiator IQN.<br><a href="#">View host configurations on page 107</a> explains how to view the ID of each host configuration. |
| -snapHosts      | Type the ID of each host configuration to give access to snapshots of the storage resource. Separate each ID with a comma.<br>By default, all iSCSI initiators on the host can access all virtual disk snapshots. To allow access for specific initiators, type the IQN of each initiator in square brackets after the host ID. For example: ID[IQN,IQN], where 'ID' is a host configuration ID and 'IQN' is an initiator IQN.<br><a href="#">View host configurations on page 107</a> explains how to view the ID of each host configuration.             |

### Example

The following command creates a generic iSCSI storage resource with these settings:

- ◆ Name is Accounting.
- ◆ Description is "Accounting apps."
- ◆ Associated to iSCSI node ISCSIN\_1.
- ◆ Uses protection schedule SCHD\_1.

The storage resource receives the ID ISCSI\_1:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /stor/prov/iscsi/res create
 -name Accounting -descr "Accounting apps" -node ISCSIN_1 -sched SCHD_1
```

```
ID = ISCSI_1
```

```
Operation completed successfully.
```

## View iSCSI storage resources

View details about iSCSI storage resources. You can filter on the ID of a storage resource.

**Note:** The [show action command on page 18](#) explains how to change the output format.

### Format

```
/stor/prov/iscsi/res [-id <value>] show
```

### Object qualifier

| Qualifier | Description                               |
|-----------|-------------------------------------------|
| -id       | Type the ID of an iSCSI storage resource. |

### Example

The following command displays details about the iSCSI storage resource on the system:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /stor/prov/iscsi/res show
```

```
1: ID = ISCSI_1
 Name = MyISCSI
 Description = My iSCSI resource
 Health state = OK (5)
 Node = ISCSIN_1
 iSCSI target = iqn.1992-05.com.emc:bb0050568134220000-1
 Total capacity = 107374182400 (100GB)
 Total protection size = 225485783040 (210GB)
 Total protection size used = 107374182400 (100GB)
```

## Change iSCSI storage resources

Change the settings for an iSCSI storage resource.

### Format

```
/stor/prov/iscsi/res -id <value> set [-name <value>] [-descr <value>]
 [-autoProtAdjust {yes|no}] [-sched <value>] [-schedPaused {yes|no}]
 [-vdiskHosts <value>] [-snapHosts <value>]
```

## Object qualifier

| Qualifier | Description                                      |
|-----------|--------------------------------------------------|
| -id       | Type the ID of iSCSI storage resource to change. |

## Action qualifiers

| Qualifier       | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|-----------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| -name           | Type a name for the storage resource.<br><br><b>Note:</b> Use a name that reflects the type and version of the application that will use it, which can facilitate how the storage resource is managed and monitored through Unisphere.                                                                                                                                                                                                                                                                                                                                                                     |
| -descr          | Type a brief description of the storage resource.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| -autoProtAdjust | Specify whether the auto-adjust protection storage feature is enabled. Value is yes or no.<br>The auto-adjust protection feature automatically adjusts the protection storage size in proportion to changes to the primary storage size.                                                                                                                                                                                                                                                                                                                                                                   |
| -sched          | Type the ID of a protection schedule to apply to the storage resource.<br><a href="#">View protection schedules on page 48</a> explains how to view the IDs of the schedules on the system.                                                                                                                                                                                                                                                                                                                                                                                                                |
| -schedPaused    | Specify whether to pause the protection schedule specified for <b>-sched</b> . Value is yes or no.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| -vdiskHosts     | Type the ID of each host configuration to give access to the virtual disks associated with the storage resource. Separate each ID with a comma.<br>By default, all iSCSI initiators on the host can access all virtual disks. To allow access for specific initiators, type the IQN of each initiator in square brackets after the host ID. For example: ID[IQN,IQN], where 'ID' is a host configuration ID and 'IQN' is an initiator IQN.<br><a href="#">View iSCSI initiators on page 111</a> explains how to view the IDs of the iSCSI initiators configured for each host configuration on the system. |
| -snapHosts      | Type the ID of each host configuration to give access to snapshots of the storage resource. Separate each ID with a comma.<br>By default, all iSCSI initiators on the host can access all virtual disk snapshots. To allow access for specific initiators, type the IQN of each initiator in square brackets after the host ID. For example: ID[IQN,IQN], where 'ID' is a host configuration ID and 'IQN' is an initiator IQN.<br><a href="#">View iSCSI initiators on page 111</a> explains how to view the IDs of the iSCSI initiators configured for each host configuration on the system.             |

## Example

The following command updates iSCSI storage resource ISCSI\_1 with these settings:

- ◆ Name is Sales.
- ◆ Description is "Sales records."
- ◆ Uses protection schedule SCHD\_2.
- ◆ The selected schedule is currently paused:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /stor/prov/iscsi/res -id
 ISCSI_1 set -name Sales -descr "Sales records" -sched SCHD_2 -schedPaused
 yes
```

```
ID = ISCSI_1
Operation completed successfully.
```



## Delete iSCSI storage resources

Delete an iSCSI storage resource.



### CAUTION

**Deleting an iSCSI storage resource removes all virtual disks and data associated with the storage resource from the system. After an iSCSI storage resource is deleted, you cannot restore the data from snapshots. Back up the data from the storage resource before deleting the storage resource.**

### Format

```
/stor/prov/iscsi/res -id <value> delete
```

### Object qualifier

| Qualifier | Description                                          |
|-----------|------------------------------------------------------|
| -id       | Type the ID of the iSCSI storage resource to delete. |

### Example

The following command deletes iSCSI storage resource ISCSI\_1:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /stor/prov/iscsi/res -id
ISCSI_1 delete
```

Operation completed successfully.

## Manage iSCSI virtual disks

A virtual disk is a single block of storage that represents a specific storage pool and quantity of a generic iSCSI storage resource. Each virtual disk is associated with a name and logical unit number (LUN) identifier. After you create a generic iSCSI storage resource, you then create virtual disks from it. Host initiators connected to a target iSCSI node can map to the virtual disk to access the iSCSI storage.

Each virtual disk is identified by an ID.

[Table 38 on page 162](#) lists the attributes for virtual disks.

**Table 38 Virtual disk attributes**

| Attribute                 | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|---------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ID                        | ID of the virtual disk.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| LUN ID                    | Logical unit number (LUN) ID of the virtual disk.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Name                      | Name of the virtual disk.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Description               | Brief description of the virtual disk.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Resource                  | ID of the generic iSCSI storage resource to which the virtual disk is associated.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Storage pool              | Name of the storage pool the virtual disk is using.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| Size                      | Quantity of storage reserved for primary data.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Maximum size              | Maximum size to which you can increase the primary storage capacity.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Thin provisioning enabled | Indication of whether thin provisioning is enabled. Value is yes or no. Default is no.<br>All storage pools support both standard and thin provisioned storage resources. For standard storage resources, the entire requested size is allocated from the pool when the resource is created, for thin provisioned storage resources only incremental portions of the size are allocated based on usage. Because thin provisioned storage resources can subscribe to more storage than is actually allocated to them, storage pools can be over provisioned to support more storage capacity than they actually possess.<br>The Unisphere online help provides more details on thin provisioning. |
| Current allocation        | If thin provisioning is enabled, the quantity of primary storage currently allocated through thin provisioning.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Protection size           | Quantity of storage reserved for protection data, such as snapshots.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Protection size used      | Quantity of storage currently used for protection data.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Maximum protection size   | Maximum size to which you can increase the protection storage size.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |

## Create virtual disks

Create a virtual disk to which host initiators connect to access iSCSI storage.

### Prerequisite

Configure an iSCSI storage resource to which to associate the virtual disks. [Create iSCSI storage resources on page 157](#) explains how to configure iSCSI storage resources.

### Format

```
/stor/prov/iscsi/vdisk create -name <value> [-descr <value>] -res <value>
 -pool <value> -size <value> [-thin {yes|no}] [-protSize <value>]
```

## Action qualifiers

| Qualifier | Description                                                                                                                                                                                                                                                  |
|-----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| -name     | Type the name of the virtual disk.                                                                                                                                                                                                                           |
| -descr    | Type a brief description of the virtual disk.                                                                                                                                                                                                                |
| -res      | Type the ID of the iSCSI storage resource to which to associate the virtual disk.<br><br><b>Note:</b> Value is case-sensitive.<br><br><a href="#">View iSCSI storage resources on page 159</a> to view the IDs of the iSCSI storage resources on the system. |
| -pool     | Type the name of the storage pool that the virtual disk will use.<br><br><b>Note:</b> Value is case-sensitive.<br><br><a href="#">View storage pools on page 126</a> explains how to view the IDs of the storage pools on the system.                        |
| -size     | Type the quantity of storage to allocate for the virtual disk.<br><a href="#">Storage resource size limitations on page 230</a> explains the limitations on storage size.                                                                                    |
| -thin     | Enable thin provisioning on the virtual disk. Value is yes or no. Default is no.                                                                                                                                                                             |
| -proSize  | Type the quantity of storage to reserve for protection data, such as snapshots.                                                                                                                                                                              |

## Example

The following command creates a virtual disk with these settings:

- ◆ Name is MyISCSIdisk.
- ◆ Description is "My iSCSI virtual disk."
- ◆ Associated with iSCSI storage resource ISCSI\_1.
- ◆ Uses the Capacity storage pool.
- ◆ Primary storage size is 100 MB.
- ◆ Protection storage size is 200 MB.

The virtual disk receives the ID ISCSIVD\_1:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /stor/prov/iscsi/vdisk
create -name "MyISCSIdisk" -descr "My iSCSI virtual disk" -res ISCSI_1 -pool
capacity -size 100MB -protSize 200MB
```

```
ID = ISCSIVD_1
Operation completed successfully.
```

## View virtual disks

View details about virtual disks on the system. You can filter on the virtual disk ID.

**Note:** [The show action command on page 18](#) explains how to change the output format.

### Format

```
/stor/prov/iscsi/vdisk [{-id <value>|-res <value>}] show
```

## Object qualifiers

| Qualifier | Description                                                                                                           |
|-----------|-----------------------------------------------------------------------------------------------------------------------|
| -id       | Type the ID of a virtual disk.                                                                                        |
| -res      | Type the ID of a generic iSCSI storage resource to view only the virtual disks associated with that storage resource. |

### Example

The following command displays details about all virtual disks on the system:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /stor/prov/iscsi/vdisk show
```

```

1: ID = ISCSI_1
 Name = MyISCSIdisk
 Description = My ISCSI virtual disk
 Resource = ISCSI_1
 Storage pool = Capacity
 Size = 2199023255552 (2TB)
 Protection size = 4617948836659 (4.2TB)
 Protection size used = 2199023255552 (2TB)

2: ID = ISCSI_2
 Name = MyISCSIdisk2
 Description = My second ISCSI virtual disk
 Resource = ISCSI_1
 Storage pool = Permormance
 Size = 104857600 (100MB)
 Protection size = 4617948836659 (4.2TB)
 Protection size used = 2199023255552 (2TB)

```

## Change virtual disks

Change the settings for a virtual disk.

### Format

```
/stor/prov/iscsi/vdisk -id <value> set [-name <value>] [-descr <value>] [-size <value>] [-protSize <value>]
```

## Object qualifier

| Qualifier | Description                                |
|-----------|--------------------------------------------|
| -id       | Type the ID of the virtual disk to change. |

## Action qualifiers

| Qualifier | Description                                                                                                                                                               |
|-----------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| -name     | Type a name for the virtual disk.                                                                                                                                         |
| -descr    | Type a brief description for the virtual disk.                                                                                                                            |
| -size     | Type the quantity of storage to allocate for the virtual disk.<br><a href="#">Storage resource size limitations on page 230</a> explains the limitations on storage size. |
| -protSize | Type the quantity of storage to reserve for protection data, such as snapshots.                                                                                           |

## Example

The following command updates virtual disk ISCSIVD\_1 with these settings:

- ◆ Name is Accounting2.
- ◆ Description is "New disk for accounting apps."
- ◆ Primary storage size is 150 MB.
- ◆ Protection storage size is 300 MB.

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /stor/prov/iscsi/vdisk -id
ISCSIVD_1 set -name Accounting2 -descr "New disk for accounting apps" -size
150MB -protSize 300MB
```

```
ID = ISCSIVD_1
Operation completed successfully.
```

## Delete virtual disks

Delete a virtual disk.



### CAUTION

**Deleting a virtual disk removes all associated data from the system. After a virtual disk is deleted, you cannot restore the data inside it from snapshots. Back up the data from a virtual disk to another host before deleting it from the system.**

## Format

```
/stor/prov/iscsi/vdisk -id <value> delete
```

## Object qualifier

| Qualifier | Description                                |
|-----------|--------------------------------------------|
| -id       | Type the ID of the virtual disk to delete. |

## Example

The following command deletes virtual disk ISCSIVD\_1:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /stor/prov/iscsi/vdisk -id
ISCSIVD_1 delete
```

Operation completed successfully.

## Manage VMware NFS datastores

**Note:** Install Service Pack 3 (SP3) or higher of the system management software to use this functionality.

VMware NFS datastores provide file-based storage to VMware ESX Servers for hosting virtual machines (VM). You can provision and manage NFS datastores and view details about each NFS datastore on the system, such as their storage capacity and health.

Each NFS datastore is identified by an ID.

Table 39 on page 167 lists the attributes for NFS datastores.

**Table 39 NFS datastore attributes**

| Attribute    | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|--------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ID           | ID of the NFS datastore.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Name         | Name of the NFS datastore.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Description  | Description of the NFS datastore.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Health state | <p>Health state of the NFS datastore. The health state code appears in parentheses. Value is one of the following:</p> <ul style="list-style-type: none"> <li>OK (5) — NFS datastore is operating normally.</li> <li>Degraded/Warning (10) — Working, but one or more of the following may have occurred: <ul style="list-style-type: none"> <li>One or more of its storage pools are degraded.</li> <li>Its replication session is degraded.</li> <li>Its replication session has faulted.</li> <li>It has almost reached full capacity. Increase the primary storage size, or create additional NFS datastores to store your data, to avoid data loss. <a href="#">Change NFS datastore settings on page 172</a> explains how to change the primary storage size.</li> </ul> </li> <li>Minor failure (15) — One or both of the following may have occurred: <ul style="list-style-type: none"> <li>One or more of its storage pools have failed</li> <li>The associated Shared Folder Server has failed.</li> </ul> </li> <li>Major failure (20) — One or both of the following may have occurred: <ul style="list-style-type: none"> <li>One or more of its storage pools have failed.</li> <li>NFS datastore is unavailable.</li> </ul> </li> <li>Critical failure (25) — One or more of the following may have occurred: <ul style="list-style-type: none"> <li>One or more of its storage pools are unavailable.</li> <li>NFS datastore is unavailable.</li> <li>NFS datastore has reached full capacity. Increase the primary storage size, or create additional NFS datastore to store your data, to avoid data loss. <a href="#">Change NFS datastore settings on page 172</a> explains how to change the primary storage size.</li> </ul> </li> <li>Non-recoverable error (30) — One or both of the following may have occurred: <ul style="list-style-type: none"> <li>One or more of its storage pools are unavailable.</li> <li>NFS datastore is unavailable.</li> </ul> </li> </ul> |
| Server       | Name of the primary Shared Folder Server that the NFS datastore uses.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Storage pool | Name of the storage pool that the NFS datastore uses.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Size         | Quantity of storage reserved for primary data.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Size used    | Quantity of storage currently used for primary data.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| Maximum size | Maximum size to which you can increase the primary storage capacity.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |

**Table 39 NFS datastore attributes**

| Attribute                   | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|-----------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Thin provisioning enabled   | Indication of whether thin provisioning is enabled. Value is yes or no. Default is no.<br>All storage pools support both standard and thin provisioned storage resources. For standard storage resources, the entire requested size is allocated from the pool when the resource is created, for thin provisioned storage resources only incremental portions of the size are allocated based on usage. Because thin provisioned storage resources can subscribe to more storage than is actually allocated to them, storage pools can be over provisioned to support more storage capacity than they actually possess.<br>The Unisphere online help provides more details on thin provisioning. |
| Current allocation          | If enabled, the quantity of primary storage currently allocated through thin provisioning.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Protection size             | Quantity of storage reserved for protection data.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Protection size used        | Quantity of storage currently used for protection data.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Maximum protection size     | Maximum size to which you can increase protection storage capacity.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| Auto-adjust protection size | Indication of whether auto-adjust protection is enabled. Value is yes or no.<br>This feature automatically adjusts the size of the protection storage in proportion with changes to the size of the primary storage.                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Protection schedule         | ID of an applied protection schedule.<br><a href="#">View protection schedules on page 48</a> explains how to view the IDs of schedules on the system.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Protection schedule paused  | Indication of whether an applied protection schedule is currently paused. Value is yes or no.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Default access              | Default access settings for host configurations and for unconfigured hosts that can reach the NFS datastore. Value is one of the following: <ul style="list-style-type: none"> <li>ro — Read-only access to primary storage and snapshots associated with the NFS datastore.</li> <li>rw — Read/write access to primary storage and snapshots associated with the NFS datastore.</li> <li>root — Read/write root access to primary storage and snapshots associated with the NFS datastore. This includes the ability to set access controls that restrict the permissions for other login accounts.</li> <li>na — No access to the NFS datastore or its snapshots.</li> </ul>                   |
| Read-only hosts             | ID of each host that has read-only permission to the NFS datastore and its snapshots.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Read/write hosts            | ID of each host that has read/write permissions to the NFS datastore and its snapshots.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Root hosts                  | ID of each host that has root permission to the NFS datastore and its snapshots.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| No access hosts             | ID of each host that has no access to the NFS datastore or its snapshots.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Replication destination     | Indication of whether the NFS datastore is a destination for a replication session (local or remote). Value is yes or no.<br><a href="#">Manage replication sessions on page 192</a> explains how to configure replication sessions on the system.                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Deduplication enabled       | Indication of whether deduplication is enabled on the NFS datastore. Value is yes or no.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |

## Create NFS datastores

Create an NFS datastore.



---

**Note:** [Size qualifiers on page 17](#) provides details on using size qualifiers to specify a storage size.

---

### Prerequisite

- ◆ Configure at least one storage pool for the NFS datastore to use and allocate at least one storage disk to the pool. [Configure storage pools automatically on page 122](#) explains how to create pools on the system automatically and [Configure custom storage pools on page 124](#) explains how to create custom pools.
- ◆ Configure at least one Shared Folder Server to which to associate the NFS datastore. [Create Shared Folder Servers on page 59](#) explains how to configure Shared Folder Servers.

### Format

```
/stor/prov/vmware/nfs create -name <value> [-replDest {yes|no}] [-descr
 <value>] -server <value> -pool <value> -size <value> [-thin {yes|no}]
 [-protSize <value>] [-autoProtAdjust {yes|no}] [-sched <value>
 [-schedPaused {yes|no}]] [-defAccess {ro|rw|root|na}] [-roHosts <value>]
 [-rwHosts <value>] [-rootHosts <value>] [-naHosts <value>]
```

## Action qualifiers

| Qualifier       | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|-----------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| -name           | Type a name for the NFS datastore.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| -replDest       | Specify to make the NFS datastore the destination of a replication session (local or remote). Value is yes or no.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| -descr          | Type a brief description of the NFS datastore.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| -server         | Type the ID of the Shared Folder Server that will be the primary storage server for the NFS datastore. <a href="#">View Shared Folder Servers on page 60</a> explains how to view the IDs of the Shared Folder Servers on the system.                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| -pool           | Type the name of the storage pool that the NFS datastore will use.<br><br><b>Note:</b> Value is case-sensitive.<br><br><a href="#">View storage pools on page 126</a> explains how to view the IDs of the storage pools on the system.                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| -size           | Type the amount of storage in the pool to reserve for the NFS datastore. <a href="#">Storage resource size limitations on page 230</a> explains the limitations on storage size.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| -thin           | Enable thin provisioning on the NFS datastore. Value is yes or no. Default is no.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| -protSize       | Type the amount of protection storage to allocate for the NFS datastore.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| -autoProtAdjust | Specify whether the protection size, entered for the <b>-protSize</b> qualifier, is automatically adjusted in proportion with changes to the size of the primary storage. Value is yes or no.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| -sched          | Type the ID of the schedule to apply to the NFS datastore. <a href="#">View protection schedules on page 48</a> explains how to view the IDs of the schedules on the system.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| -schedPaused    | Pause the schedule specified for the <b>-sched</b> qualifier. Value is yes or no. Default is no.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| -defAccess      | Specify the default share access settings for host configurations and for unconfigured hosts that can reach the NFS datastore. Value is one of the following: <ul style="list-style-type: none"> <li>ro — Read-only access to primary storage and snapshots associated with the NFS datastore.</li> <li>rw — Read/write access to primary storage and snapshots associated with the NFS datastore.</li> <li>root — Read/write root access to primary storage and snapshots associated with the NFS datastore. This includes the ability to set access controls that restrict the permissions for other login accounts.</li> <li>na — No access to the NFS datastore or its snapshots.</li> </ul> |
| -roHosts        | Type the ID of each host configuration you want to grant read-only permission to the NFS datastore and its snapshots. Separate each ID with a comma.<br>For host configurations of type 'host,' by default, all of the host's IP addresses can access the NFS datastore and its snapshots. To allow access to only specific IPs, type those specific IPs in square brackets after the host ID. For example: ID[IP,IP], where 'ID' is a host configuration ID and 'IP' is an IP address.<br><a href="#">View host configurations on page 107</a> explains how to view the ID of each host configuration.                                                                                          |

| Qualifier  | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| -rwHosts   | <p>Type the ID of each host configuration you want to grant read-write permission to the NFS datastore and its snapshots. Separate each ID with a comma.</p> <p>For host configurations of type 'host,' by default, all of the host's IP addresses can access the NFS datastore and its snapshots. To allow access to only specific IPs, type those specific IPs in square brackets after the host ID. For example: ID[IP,IP], where 'ID' is a host configuration ID and 'IP' is an IP address.</p> <p><a href="#">View host configurations on page 107</a> explains how to view the ID of each host configuration.</p> |
| -rootHosts | <p>Type the ID of each host configuration you want to grant root permission to the NFS datastore and its snapshots. Separate each ID with a comma.</p> <p>For host configurations of type 'host,' by default, all of the host's IP addresses can access the NFS datastore and its snapshots. To allow access to only specific IPs, type those specific IPs in square brackets after the host ID. For example: ID[IP,IP], where 'ID' is a host configuration ID and 'IP' is an IP address.</p> <p><a href="#">View host configurations on page 107</a> explains how to view the ID of each host configuration.</p>       |
| -naHosts   | <p>Type the ID of each host configuration you want to block access to the NFS datastore and its snapshots. Separate each ID with a comma.</p> <p>For host configurations of type 'host,' by default, all of the host's IP addresses cannot access the NFS datastore and its snapshots. To limit access for specific IPs, type the IPs in square brackets after the host ID. For example: ID[IP,IP], where 'ID' is a host configuration ID and 'IP' is an IP address.</p> <p><a href="#">View host configurations on page 107</a> explains how to view the ID of each host configuration.</p>                            |

### Example

The following command creates an NFS datastore with these settings:

- ◆ Named Accounting.
- ◆ Description is "Accounting VMs."
- ◆ Uses Shared Folder Server SFServer00 as the primary storage server.
- ◆ Uses the capacity storage pool.
- ◆ Primary storage size is 100 GB
- ◆ No protection schedule.

The shared folder receives the ID NFSDS\_1:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /stor/prov/vmware/nfs create
 -name Accounting -descr "Accounting VMs" -server SFServer00 -pool capacity
 -size 100G
```

```
ID = NFSDS_1
Operation completed successfully.
```

## View NFS datastores

View details about an NFS datastore. You can filter on the NFS datastore ID.

**Note:** [The show action command on page 18](#) explains how to change the output format.

### Format

```
/stor/prov/vmware/nfs [-id <value>|-remSys <value>] show
```

## Object qualifier

| Qualifiers | Description                      |
|------------|----------------------------------|
| -remSys    | Type the ID of an NFS datastore. |

### Example

The following command lists details about all NFS datastores on the system:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /stor/prov/vmware/nfs show
```

```
1: ID = NFSDS_1
 Name = Accounting2
 Description = Accounting VMs
 Health state = OK (5)
 Server = SFServer00
 Storage pool = capacity
 Size = 536870912000 (500GB)
 Size used = 128849018880 (120GB)
 Protection size = 536870912000 (500GB)
 Protection size used = 0
 Export path = 10.64.75.10/Accounting2
```

## Change NFS datastore settings

Change the settings for an NFS datastore.

**Note:** [Size qualifiers on page 17](#) explains how to use the size qualifiers when specifying a storage size.

### Format

```
/stor/prov/vmware/nfs -id <value> set [-name <value>] [-descr <value>] [-size
<value>] [-thin {yes|no}] [-protSize <value>] [-autoProtAdjust {yes|no}]
[-sched <value>] [-schedPaused {yes|no}] [-defAccess <value>] [-roHosts
<value>] [-rwHosts <value>] [-rootHosts <value>] [-naHosts <value>]
```

## Object qualifier

| Qualifier | Description                                 |
|-----------|---------------------------------------------|
| -id       | Type the ID of the NFS datastore to change. |

## Action qualifiers

| Qualifier       | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|-----------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| -name           | Type a name for the NFS datastore.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| -descr          | Type a brief description of the NFS datastore.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| -size           | Type the amount of storage in the pool to reserve for the NFS datastore.<br><a href="#">Storage resource size limitations on page 230</a> explains the limitations on storage size.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| -thin           | Enable thin provisioning on the NFS datastore. Value is yes or no. Default is no.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| -protSize       | Type the amount of protection storage to allocate for the NFS datastore.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| -autoProtAdjust | Specify whether the protection size, entered for the <b>-protSize</b> qualifier, is automatically adjusted in proportion with changes to the size of the primary storage. Value is yes or no.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| -sched          | Type the ID of the schedule to apply to the NFS datastore.<br><a href="#">View protection schedules on page 48</a> explains how to view the IDs of the schedules on the system.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| -schedPaused    | Pause the schedule specified for the <b>-sched</b> qualifier. Value is yes or no. Default is no.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| -defAccess      | Specify the default share access settings for host configurations and for unconfigured hosts that can reach the NFS datastore. Value is one of the following: <ul style="list-style-type: none"> <li>ro — Read-only access to primary storage and snapshots associated with the NFS datastore.</li> <li>rw — Read/write access to primary storage and snapshots associated with the NFS datastore.</li> <li>root — Read/write root access to primary storage and snapshots associated with the NFS datastore. This includes the ability to set access controls that restrict the permissions for other login accounts.</li> <li>na — No access to the NFS datastore or its snapshots.</li> </ul> |
| -roHosts        | Type the ID of each host configuration you want to grant read-only permission to the NFS datastore and its snapshots. Separate each ID with a comma.<br>For host configurations of type 'host,' by default, all of the host's IP addresses can access the NFS datastore and its snapshots. To allow access to only specific IPs, type those specific IPs in square brackets after the host ID. For example: ID[IP,IP], where 'ID' is a host configuration ID and 'IP' is an IP address.<br><a href="#">View host configurations on page 107</a> explains how to view the ID of each host configuration.                                                                                          |

| Qualifier  | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| -rwHosts   | Type the ID of each host configuration you want to grant read-write permission to the NFS datastore and its snapshots. Separate each ID with a comma.<br>For host configurations of type 'host,' by default, all of the host's IP addresses can access the NFS datastore and its snapshots. To allow access to only specific IPs, type those specific IPs in square brackets after the host ID. For example: ID[IP,IP], where 'ID' is a host configuration ID and 'IP' is an IP address.<br><a href="#">View host configurations on page 107</a> explains how to view the ID of each host configuration. |
| -rootHosts | Type the ID of each host configuration you want to grant root permission to the NFS datastore and its snapshots. Separate each ID with a comma.<br>For host configurations of type 'host,' by default, all of the host's IP addresses can access the NFS datastore and its snapshots. To allow access to only specific IPs, type those specific IPs in square brackets after the host ID. For example: ID[IP,IP], where 'ID' is a host configuration ID and 'IP' is an IP address..<br><a href="#">View host configurations on page 107</a> explains how to view the ID of each host configuration.      |
| -naHosts   | Type the ID of each host configuration you want to block access to the NFS datastore and its snapshots. Separate each ID with a comma.<br>For host configurations of type 'host,' by default, all of the host's IP addresses cannot access the NFS datastore and its snapshots. To limit access for specific IPs, type the IPs in square brackets after the host ID. For example: ID[IP,IP], where 'ID' is a host configuration ID and 'IP' is an IP address.<br><a href="#">View host configurations on page 107</a> explains how to view the ID of each host configuration.                            |

### Example

The following command changes NFS datastore NFSDS\_1 to provide read-only access permissions to host configurations HOST\_1 and HOST\_2 and blocks access for HOST\_3:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /stor/prov/vmware/nfs -id
NFSDS_1 set -roHosts "HOST_1,HOST_2" -naHosts "HOST_3"
```

```
ID = NFSDS_1
Operation completed successfully.
```

## Delete NFS datastores

Delete an NFS datastore.



### CAUTION

**Deleting an NFS datastore removes any files and folders associated with it from the system. You cannot use snapshots to restore the contents of the datastore. Back up the data from the datastore before deleting it from the system.**

### Format

```
/stor/prov/vmware/nfs [-id <value>] delete
```

### Object qualifier

| Qualifier | Description                                 |
|-----------|---------------------------------------------|
| -id       | Type the ID of the NFS datastore to delete. |

### Example

The following command deletes NFS datastore NFSDS\_1:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /stor/prov/vmware/nfs -id
NFSDS_1 delete
```

Operation completed successfully.

## Manage VMware VMFS datastores

**Note:** Install Service Pack 3 (SP3) or higher of the system management software to use this functionality.

Virtual Machine Filesystem (VMFS) datastores provide block storage for ESX Server hosts. VMFS datastores appear to ESX Server hosts as virtual disks, to which the hosts connect through the iSCSI protocol. You can provision and manage NFS datastores and view details about each NFS datastore on the system, such as their storage capacity and health.

Each VMFS datastore is identified by an ID.

[Table 37 on page 156](#) lists the attributes for VMFS datastores.

**Table 40 VMFS datastore attributes**

| Attribute    | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|--------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ID           | ID of the VMFS datastore.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| LUN ID       | Logical unit number (LUN) ID of the VMFS datastore.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| Name         | Name of the VMFS datastore.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Description  | Brief description of the VMFS datastore.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Health state | <p>Health state of the VMFS datastore. The health state code appears in parentheses. Value is one of the following:</p> <ul style="list-style-type: none"> <li>OK (5) — Datastore is operating normally.</li> <li>Degraded/Warning (10) — Working, but one or more of the following may have occurred: <ul style="list-style-type: none"> <li>One or more of its storage pools are degraded.</li> <li>Its replication session is degraded.</li> <li>Its replication session has faulted.</li> <li>It has almost reached full capacity. Increase the primary storage size, or create additional datastores to store your data, to avoid data loss. <a href="#">Change VMware VMFS datastore settings on page 179</a> explains how to increase the primary storage size.</li> </ul> </li> <li>Minor failure (15) — One or both of the following may have occurred: <ul style="list-style-type: none"> <li>One or more of its storage pools have failed.</li> <li>The associated iSCSI node has failed.</li> </ul> </li> <li>Major (20) — One or both of the following may have occurred: <ul style="list-style-type: none"> <li>Datastore is unavailable.</li> <li>One or more of the associated storage pools have failed.</li> </ul> </li> <li>Critical failure (25) — One or more of the following may have occurred: <ul style="list-style-type: none"> <li>One or more of its storage pools are unavailable.</li> <li>Datastore is unavailable.</li> <li>Datastore has reached full capacity. Increase the primary storage size, or create additional datastores to store your data, to avoid data loss. <a href="#">Change VMware VMFS datastore settings on page 179</a> explains how to increase the primary storage size.</li> </ul> </li> <li>Non-recoverable error (30) — One or both of the following may have occurred: <ul style="list-style-type: none"> <li>Datastore is unavailable.</li> <li>One or more of the associated storage pools are unavailable.</li> </ul> </li> </ul> |
| Node         | Name of the iSCSI node to which the VMFS datastore is associated.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| iSCSI target | iSCSI address (IQN) of the associated iSCSI node.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Storage pool | Name of the storage pool the virtual disk is using.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| Size         | Quantity of storage reserved for primary data.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Maximum size | Maximum size to which you can increase the primary storage capacity.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |



**Table 40 VMFS datastore attributes (continued)**

| Attribute                   | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|-----------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Thin provisioning enabled   | Indication of whether thin provisioning is enabled. Value is yes or no. Default is no.<br>All storage pools support both standard and thin provisioned storage resources. For standard storage resources, the entire requested size is allocated from the pool when the resource is created, for thin provisioned storage resources only incremental portions of the size are allocated based on usage. Because thin provisioned storage resources can subscribe to more storage than is actually allocated to them, storage pools can be over provisioned to support more storage capacity than they actually possess.<br>The Unisphere online help provides more details on thin provisioning. |
| Current allocation          | If thin provisioning is enabled, the quantity of primary storage currently allocated through thin provisioning.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Protection size             | Quantity of storage reserved for protection data, such as snapshots.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Protection size used        | Quantity of storage currently used for protection data.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Maximum protection size     | Maximum size to which you can increase the protection storage size.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| Auto-adjust protection size | Indication of whether the auto-adjust protection storage feature is enabled. Value is yes or no.<br>The auto-adjust protection feature automatically adjusts the protection storage size in proportion to changes to the primary storage size.                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Protection schedule         | ID of a protection schedule applied to the VMFS datastore.<br><a href="#">View protection schedules on page 48</a> explains how to view the IDs of the schedules on the system.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Protection schedule paused  | Indication of whether an applied protection schedule is currently paused.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Virtual disk access hosts   | List of hosts with access permissions to the VMFS datastore, presented to the hosts as a virtual disk. Each host displays the host identifier followed by a comma-separated list of host IQNs enclosed in square brackets.                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Snapshots access hosts      | List of hosts with access permissions to the VMFS datastore snapshots. Each host displays the host identifier followed by a comma-separated list of host IQNs enclosed in square brackets.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |

## Create VMware VMFS datastores

Create a VMFS datastore.

### Prerequisite

- ◆ Configure at least one storage pool for the VMFS datastore to use and allocate at least one storage disk to the pool. [Configure storage pools automatically on page 122](#) explains how to create storage pools automatically on the system and [Configure custom storage pools on page 124](#) explains how to create a custom storage pool on the system.
- ◆ Configure at least one iSCSI node to which to associate the VMFS datastore. [Create iSCSI nodes on page 68](#) explains how to create iSCSI nodes on the system.

### Format

```
/stor/prov/vmware/vmfs create -name <value> [-descr <value>] -node <value>
 -pool <value> -size <value> [-thin {yes|no}] [-protSize <value>]
 [-autoProtAdjust {yes|no}] [-sched <value> [-schedPaused {yes|no}]]
 [-vdiskHosts <value>] [-snapHosts <value>]
```

## Action qualifiers

| Qualifier       | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|-----------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| -name           | Type a name for the VMFS datastore.<br><br><b>Note:</b> Use a name that reflects the type and version of the application that will use it, which can facilitate how the VMFS datastore is managed and monitored through Unisphere.                                                                                                                                                                                                                                                                                                                 |
| -descr          | Type a brief description of the VMFS datastore.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| -node           | Type the ID of the iSCSI node to which to associate the VMFS datastore.<br><a href="#">View iSCSI nodes on page 68</a> to view the IDs of the iSCSI nodes on the system.                                                                                                                                                                                                                                                                                                                                                                           |
| -pool           | Type the name of the storage pool that the VMFS datastore will use.<br><br><b>Note:</b> Value is case-sensitive.<br><br><a href="#">View storage pools on page 126</a> explains how to view the IDs of the storage pools on the system.                                                                                                                                                                                                                                                                                                            |
| -size           | Type the quantity of storage to allocate for the VMFS datastore.<br><a href="#">Storage resource size limitations on page 230</a> explains the limitations on storage size.                                                                                                                                                                                                                                                                                                                                                                        |
| -thin           | Enable thin provisioning on the VMFS datastore. Value is yes or no. Default is no.                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| -proSize        | Type the quantity of storage to reserve for protection data, such as snapshots.                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| -autoProtAdjust | Specify whether the auto-adjust protection storage feature is enabled. Value is yes or no.<br>The auto-adjust protection feature automatically adjusts the protection storage size in proportion to changes to the primary storage size.                                                                                                                                                                                                                                                                                                           |
| -sched          | Type the ID of a protection schedule to apply to the VMFS datastore.<br><a href="#">View protection schedules on page 48</a> explains how to view the IDs of the schedules on the system.                                                                                                                                                                                                                                                                                                                                                          |
| -schedPaused    | Specify whether to pause the protection schedule specified for <b>-sched</b> . Value is yes or no.                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| -vdiskHosts     | Type the ID of each host configuration to give access to the VMFS datastore. Separate each ID with a comma.<br><br>By default, all iSCSI initiators on the host can access the VMFS datastore. To allow access for specific initiators, type the IQN of each initiator in square brackets after the host ID. For example: ID[IQN,IQN], where 'ID' is a host configuration ID and 'IQN' is an initiator IQN.<br><a href="#">View host configurations on page 107</a> explains how to view the ID of each host configuration.                        |
| -snapHosts      | Type the ID of each host configuration to give access to snapshots of the VMFS datastore. Separate each ID with a comma.<br><br>By default, all iSCSI initiators on the host can access all VMFS datastore snapshots. To allow access for specific initiators, type the IQN of each initiator in square brackets after the host ID. For example: ID[IQN,IQN], where 'ID' is a host configuration ID and 'IQN' is an initiator IQN.<br><a href="#">View host configurations on page 107</a> explains how to view the ID of each host configuration. |

### Example

The following command creates a VMFS datastore with these settings:

- ◆ Name is Accounting3.
- ◆ Description is "Accounting Group 3."
- ◆ Associated to iSCSI node ISCSIN\_1.
- ◆ Uses the capacity storage pool.
- ◆ Provides host access permissions to the VMFS datastore (presented as a virtual disk) to two of the IQNs for host configuration 1014 and for host configuration 1014.

- ◆ No protection schedule.

The VMFS datastore receives the ID VMFS\_1:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /stor/prov/vmware/vmfs
create -name "Accounting3" -descr "Accounting Group 3" node ISCSIN_1 -pool
capacity -size 100G -thin yes -vdiskHosts
"1014[iqn.2001-04.com.lab:storage,iqn.2001-04.com.example:storage2],1015"
```

ID = VMFS\_1

Operation completed successfully.

## View VMware VMFS datastores

View details about VMFS datastores. You can filter on the ID of a VMFS datastore.

**Note:** The [show action command on page 18](#) explains how to change the output format.

### Format

```
/stor/prov/vmware/vmfs [-id <value>] show
```

### Object qualifier

| Qualifier | Description                      |
|-----------|----------------------------------|
| -id       | Type the ID of a VMFS datastore. |

### Example

The following command displays details about the VMFS datastore on the system:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /stor/prov/vmware/vmfs show
```

```
1: ID = VMFS_1
 LUN ID = 1
 Name = Accounting3
 Description = Accounting Group 3
 Health state = OK (5)
 Node = ISCSIN_1
 iSCSI target = iqn.1992-05.com.emc:bb0050568134220000-1
 Storage pool = capacity
 Size = 107374182400 (100GB)
 Protection size = 107374182400 (100GB)
 Protection size used = 0
```

## Change VMware VMFS datastore settings

Change the settings for a VMFS datastore.

### Format

```
/stor/prov/vmware/vmfs -id <value> set [-name <value>] [-descr <value>] [-size
<value>] [-protSize <value>] [-autoProtAdjust {yes|no}] [-sched <value>]
[-schedPaused {yes|no}] [-vdiskHosts <value>] [-snapHosts <value>]
```

## Object qualifier

| Qualifier | Description                                  |
|-----------|----------------------------------------------|
| -id       | Type the ID of the VMFS datastore to change. |

## Action qualifiers

| Qualifier       | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|-----------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| -name           | Type a name for the VMFS datastore.<br><br><b>Note:</b> Use a name that reflects the type and version of the application that will use it, which can facilitate how the VMFS datastore is managed and monitored through Unisphere.                                                                                                                                                                                                                                                                                                             |
| -descr          | Type a brief description of the VMFS datastore.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| -size           | Type the quantity of storage to allocate for the VMFS datastore.<br><a href="#">Storage resource size limitations on page 230</a> explains the limitations on storage size.                                                                                                                                                                                                                                                                                                                                                                    |
| -proSize        | Type the quantity of storage to reserve for protection data, such as snapshots.                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| -autoProtAdjust | Specify whether the auto-adjust protection storage feature is enabled. Value is yes or no.<br>The auto-adjust protection feature automatically adjusts the protection storage size in proportion to changes to the primary storage size.                                                                                                                                                                                                                                                                                                       |
| -sched          | Type the ID of a protection schedule to apply to the VMFS datastore.<br><a href="#">View protection schedules on page 48</a> explains how to view the IDs of the schedules on the system.                                                                                                                                                                                                                                                                                                                                                      |
| -schedPaused    | Specify whether to pause the protection schedule specified for <b>-sched</b> . Value is yes or no.                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| -vdiskHosts     | Type the ID of each host configuration to give access to the VMFS datastore. Separate each ID with a comma.<br>By default, all iSCSI initiators on the host can access the VMFS datastore. To allow access for specific initiators, type the IQN of each initiator in square brackets after the host ID. For example: ID[IQN,IQN], where 'ID' is a host configuration ID and 'IQN' is an initiator IQN.<br><a href="#">View host configurations on page 107</a> explains how to view the ID of each host configuration.                        |
| -snapHosts      | Type the ID of each host configuration to give access to snapshots of the VMFS datastore. Separate each ID with a comma.<br>By default, all iSCSI initiators on the host can access all VMFS datastore snapshots. To allow access for specific initiators, type the IQN of each initiator in square brackets after the host ID. For example: ID[IQN,IQN], where 'ID' is a host configuration ID and 'IQN' is an initiator IQN.<br><a href="#">View host configurations on page 107</a> explains how to view the ID of each host configuration. |

## Example

The following command updates VMFS datastore VMFS\_1 with these settings:

- ◆ Name is Accounting4.
- ◆ Description is "Accounting Group 4."

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /stor/prov/vmware/vmfs -id VMFS_1 set -name Accounting4 -descr "Accounting Group 4"
```

```
ID = VMFS_1
Operation completed successfully.
```

# Delete VMware VMFS datastores

Delete a VMFS datastore.



**CAUTION**

**Deleting a VMFS datastore removes all data and snapshots of it from the system. After the VMFS datastore is deleted, you cannot restore the data from snapshots. Back up all data from the VMFS datastore before deleting it.**

**Format**

`/stor/prov/vmware/vmfs -id <value> delete`

**Object qualifier**

| Qualifier | Description                                  |
|-----------|----------------------------------------------|
| -id       | Type the ID of the VMFS datastore to delete. |

**Example**

The following command deletes VMFS datastore VMFS\_1:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /stor/prov/vmware/vmfs -id VMFS_1 delete
```

Operation completed successfully.

## Manage data deduplication

Deduplication increases file storage efficiency by eliminating redundant data from the files stored in the filesystem on a storage resource, such as a shared folder, which saves storage space. Enable deduplication on a storage resource and the system scans the filesystem on the storage resource for redundant data and deduplicates the data to free storage space. The scan runs once every week.

When the system is busy, scanning is limited, or suspended, so as not to further reduce system performance. When the system returns to normal operation, normal scanning resumes. After deduplicating a filesystem, the amount of storage used by the storage resource is significantly reduced, as much as 50 percent. The Unisphere online help provides more details about deduplication.

You can enable deduplication for shared folders.

[Table 41 on page 182](#) lists the attributes for deduplication.

**Table 41 Deduplication attributes**

| Attribute                | Description                                                                                                                                                                                                                                                                                                                                |
|--------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ID                       | ID of the storage resource on which deduplication is enabled.                                                                                                                                                                                                                                                                              |
| Enabled                  | Indication of whether deduplication is enabled. Value is yes or no.                                                                                                                                                                                                                                                                        |
| State                    | State of deduplication, which performs a scan once a week. Value is one of the following: <ul style="list-style-type: none"> <li>paused — System is not currently scanning the storage resource.</li> <li>running — System is currently scanning the storage resource. This is the default value when deduplication is enabled.</li> </ul> |
| Excluded file extensions | List of file extensions that specify the files that will not be deduplicated. Each file extension is separated by a colon.                                                                                                                                                                                                                 |
| Excluded paths           | List of paths on the filesystem that contains files that will not be deduplicated. Each path is separated by a semi-colon.                                                                                                                                                                                                                 |
| Last scan                | Date and time when the system last scanned the filesystem.                                                                                                                                                                                                                                                                                 |
| Total size               | Total capacity size of the storage resource on which deduplication is enabled.                                                                                                                                                                                                                                                             |
| Original size used       | Amount of storage used by the storage resource before its files are deduplicated.                                                                                                                                                                                                                                                          |
| Current size used        | Amount of storage used by the storage resource after its files are deduplicated.                                                                                                                                                                                                                                                           |

## View deduplication settings

View details about the deduplication settings on the system.

**Note:** [The show action command on page 18](#) explains how to change the output format.

### Format

```
/eff/dedup [-id <value>] show
```

## Object qualifier

| Qualifier | Description                                                          |
|-----------|----------------------------------------------------------------------|
| -id       | Type the ID of a storage resource on which deduplication is enabled. |

### Example

The following command displays the deduplication settings:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /eff/dedup show
```

```
1: ID = SFS_1
 Resource type = sf
 State = running
 File exclude list = jpg:gif
 Path exclude list = /home/photo
```

## Configure deduplication settings

Configure deduplication settings for a storage resource.

### Format

```
/eff/dedup -id <value> set [-enabled {yes|no}] [-state {running|paused}]
[fileExcList <value>] [-pathExcList <value>]
```

## Object qualifier

| Qualifier | Description                                                              |
|-----------|--------------------------------------------------------------------------|
| -id       | Type the ID of the storage resource on which to configure deduplication. |

### Action qualifiers.

| Qualifier | Description                                                                                                                                                                                                                                                                                                                                            |
|-----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| -enabled  | <p>Enable deduplication. Value is yes or no.</p> <p><b>Note:</b> When you disable deduplication, all files on the storage resource will be re-deduplicated, which returns the storage usage to its original size before the files were deduplicated. Ensure the storage pool can accommodate the added storage use before disabling deduplication.</p> |

| Qualifier    | Description                                                                                                                                                                                                                                                                                                                                                                                                                      |
|--------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| -state       | Specify to pause or run deduplication scanning, which scans the target storage resource once a week. Value is one of the following: <ul style="list-style-type: none"> <li>running — System will scan the storage resource. This is the default value when <b>-enabled</b> is yes.</li> <li>paused — System will not scan the storage resource.</li> </ul> <b>Note:</b> To change this qualifier, deduplication must be enabled. |
| -fileExcList | Type a list of file extensions for files that will not be deduplicated. Use a semicolon to separate each file extension. <b>Note:</b> To change this qualifier, deduplication must be enabled and the value of <b>-state</b> must be paused.                                                                                                                                                                                     |
| -pathExcList | List of paths on the filesystem that contain files that will not be deduplicated. Use a colon to separate the paths. <b>Note:</b> To change this qualifier, deduplication must be enabled and <b>-state</b> must be paused.                                                                                                                                                                                                      |

### Example

The following command pauses deduplication scanning for shared folder SFS\_1:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /eff/dedup -id SFS_1 set
 -state paused
```

```
ID = SFS_1
Operation completed successfully.
```

## Force a rescan

Rescan a target storage resource to deduplicate it immediately. By default, the system performs a scan once every week.

### Format

```
/eff/dedup -id <value> rescan
```

### Object qualifier

| Qualifier | Description                                                          |
|-----------|----------------------------------------------------------------------|
| -id       | Type the ID of a storage resource on which deduplication is enabled. |

### Example

The following command forces deduplication scanning of shared folder SFS\_1:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /eff/dedup -id SFS_1 rescan
```

```
Operation completed successfully.
```



# 7

## Protect Data

This chapter addresses the following topics:

|                                   |     |
|-----------------------------------|-----|
| Manage snapshots .....            | 186 |
| Manage replication sessions ..... | 192 |

## Manage snapshots

A snapshot is a virtual point-in-time image of the data within a storage resource that has changed since the last snapshot. Snapshots provide a record of the content in the targeted storage resource at a particular date and time, but are not mirror copies of the data. Periodically creating snapshots of filesystems and virtual disks provides an effective technique for meeting data protection and recovery requirements. Based on the importance and volatility of data within a storage resource, you can define recurring schedules that specify times and intervals for snapshot operations.

Use snapshots to perform the following:

- ◆ Restore a storage resource to a previous point-in-time.
- ◆ Access the contents of a snapshot to recover corrupted or accidentally deleted files and data.

To routinely take snapshots automatically, associate a snapshot with a schedule. [Manage snapshot protection schedules on page 48](#) explains how to configure schedules on the system.

Each snapshot is identified by an ID.

---

**Note:** Snapshots do not provide a substitute for storage backup operations. Snapshots are not intended to provide resources for recovering from disasters or the loss of physical equipment.

---



---

**Note:** To ensure a host has the correct permissions to access snapshots, check the host access permissions for the appropriate storage resource. [View shared folders on page 143](#) explains how to view host access permissions for shared folders. [View iSCSI storage resources on page 159](#) explains how to view the host access permissions for iSCSI storage resources.

---

[Table 42 on page 186](#) lists the attributes for snapshots.

**Table 42 Snapshot attributes**

| Attribute     | Description                                                                                                                                                                                                                        |
|---------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ID            | ID of the snapshot.                                                                                                                                                                                                                |
| Name          | Name of the snapshot.                                                                                                                                                                                                              |
| State         | State of the snapshot. Value is one of the following: <ul style="list-style-type: none"> <li>• OK — Snapshot is available to hosts.</li> <li>• Expired — Snapshot has expired. The system will delete it automatically.</li> </ul> |
| Promoted      | For snapshots of iSCSI storage resources, indication of whether the snapshot is currently promoted for host access. Value is yes or no.                                                                                            |
| Resource ID   | ID of the storage resource of which the system created the snapshot.                                                                                                                                                               |
| Resource type | Type of storage resource of which the system created the snapshot.                                                                                                                                                                 |
| Creation time | Date and time when the snapshot was created.                                                                                                                                                                                       |

**Table 42 Snapshot attributes (continued)**

| Attribute       | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|-----------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Expiration time | Date and time when the snapshot will expire and be deleted from the system. Default is 7 days.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| Created by      | <p>Name of the user, protection schedule, or backup process that created the snapshot. Value is one of the following:</p> <ul style="list-style-type: none"> <li>For manual snapshots created by a user, the user account name.</li> <li>For scheduled snapshots, the name of the protection schedule.</li> <li>For snapshots created by host backup software: <ul style="list-style-type: none"> <li>NDMP — Indicates a snapshot created by using the Network Data Management Protocol (NDMP).</li> <li>VSS — Indicates a snapshot created by using the Microsoft Volume Snapshot Service (VSS), also called Shadow Copy or Previous Version.</li> </ul> </li> <li>Snapshot Restore — Indicates a snapshot created automatically by the system when restoring a shared folder or VMware NFS datastore. You can use the snapshot to return the storage resource to the state it was in prior to the last restore.</li> <li>Replication Manager: Indicates an application consistent snapshot created by EMC Replication Manager.</li> </ul> |
| Attached LUN(s) | List of logical unit numbers (LUNs) attached to the snapshot.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |

## Create snapshots

Create a snapshot of a storage resource.

**Note:** Snapshots of iSCSI virtual disks are not intended for use as mirrors, disaster recovery, or high-availability tools. Because iSCSI snapshots are partially derived from real-time data on iSCSI virtual disks, snapshots can become inaccessible (not readable) if the primary virtual disk becomes inaccessible.

### Prerequisite

Snapshots are stored in the protection capacity of the storage resource. Ensure that enough protection capacity exists to accommodate snapshots. [View shared folders on page 143](#) explains how to view the current protection storage size for shared folders. [View iSCSI storage resources on page 159](#) explains how to view the current protection size for iSCSI storage resources.

### Format

```
/prot/snap create [-name <value>] -res <value> [-keepFor <value>]
```

## Action qualifiers

| Qualifier | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|-----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| -name     | Type a name for the snapshot.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| -res      | Type the ID of the storage resource of which to take a snapshot.<br><a href="#">View shared folders on page 143</a> explains how to view the settings for shared folders. <a href="#">View iSCSI storage resources on page 159</a> explains how to view the settings for iSCSI storage resources.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| -keepFor  | Type the number of days or hours to retain a snapshot before it expires. The system deletes expired snapshots automatically. Use the following format:<br><code>&lt;value&gt;&lt;qualifier&gt;</code><br>where: <ul style="list-style-type: none"> <li><i>value</i> — Type the number of hours or days:               <ul style="list-style-type: none"> <li>For hours, the range is 1–744.</li> <li>For days, the range is 1–31.</li> </ul> </li> <li><i>qualifier</i> — Type the value qualifier. Value is one of the following:               <ul style="list-style-type: none"> <li>h — Indicates hours.</li> <li>d — Indicates days.</li> </ul> </li> </ul> Default value is 7d (7 days).<br><br><b>Note:</b> For scheduled snapshots, which are associated with a schedule, include the <b>-keepFor</b> qualifier in the schedule rules to specify the retention period. <a href="#">Manage task rules on page 50</a> provides details about schedule rules. |

### Example

The following command takes a snapshot of a shared folder with these settings:

- ◆ Name is accounting.
- ◆ Storage resource is shared folder SFS\_1.
- ◆ Retention period is 1 day.

The snapshot receives ID SNAP\_1:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /prot/snap create -name
 accounting -res SFS_1 -keepFor 1d
```

ID = SNAP\_1

Operation completed successfully.

## View snapshots

View details about snapshots on the system. You can filter on the snapshot ID or storage resource ID.

**Note:** [The show action command on page 18](#) explains how to change the output format.

### Format

```
/pro/snap [{-id <value>|-res <value>}] show
```

## Object qualifiers

| Qualifier | Description                                                                 |
|-----------|-----------------------------------------------------------------------------|
| -id       | Type the ID of a snapshot.                                                  |
| -res      | Type the ID of a storage resource to view only the snapshots related to it. |

### Example

The following command displays details about all snapshots on the system:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /prot/snap show
```

```
1: ID = SNAP_1
 Name = Snapshot1
 State = OK
 Promoted = no
 Resource = EXCH_1
 Resource type = exchange
 Attached LUN(s) = 1 (Database) , 2 (Log)

2: ID = SNAP_2
 Name = Snapshot2
 State = OK
 Promoted = no
 Resource = ISCSI_1
 Resource type = iscsi
 Attached LUN(s) = 1 (My first disk) , 2 (My second disk)
```

## Promote snapshots to hosts

For snapshots of iSCSI storage resources, promote a snapshot to make it available to hosts.

**Note:** Before a host can access a promoted snapshot, it must have snapshot permissions to the appropriate iSCSI storage resource. [Manage generic iSCSI storage resources on page 156](#) explains how to configure host access permissions for iSCSI storage resources.

### Format

```
/prot/snap -id <value> attach
```

### Object qualifier

| Qualifier | Description                             |
|-----------|-----------------------------------------|
| -id       | Type the ID of the snapshot to promote. |

### Example

The following command promotes snapshot SNAP\_1:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /prot/snap -id SNAP_1 attach
```

```
ID = SNAP_1
Operation completed successfully.
```

## Demote snapshots

For snapshots of iSCSI storage resources, demote a promoted snapshot to block host access to the snapshot.

**Note:** Before a host can access a promoted snapshot, it must have snapshot permissions to the appropriate iSCSI storage resource. [Manage generic iSCSI storage resources on page 156](#) explains how to configure host access permissions for generic iSCSI storage.

### Format

```
/prot/snap -id <value> detach
```

### Object qualifier

| Qualifier | Description                            |
|-----------|----------------------------------------|
| -id       | Type the ID of the snapshot to demote. |

### Example

The following command demotes snapshot SNAP\_1:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /prot/snap -id SNAP_1 detach
```

```
ID = SNAP_1
Operation completed successfully.
```

## Restore storage resources to snapshots

Restore a storage resource to a snapshot to return (roll back) the storage resource to a previous state. During the restore, the entire storage resource, including all files and data stored on it, is replaced with the contents of the selected snapshot.

**Note:** Before the restoration begins, the system creates a snapshot of the shared folder to be restored. You can use the snapshot to restore the shared folder to its previous state before you restored it the first time.



### CAUTION

**For generic iSCSI storage, any snapshots that were created after the snapshot to which you restore are destroyed and cannot be recovered. For Shared Folders, all snapshots remain on the system.**

### Prerequisites

- ◆ To prevent data loss, ensure that all hosts have completed all read and write operations to the storage resource you want to restore.
- ◆ For generic iSCSI storage:
  - If the snapshot is promoted you must first demote it or an error will appear when you attempt to restore to it.
  - If a host is connected to the virtual disk (seen by the host as a disk) you want to restore, the restore will not complete. Perform one of the following to the virtual disk to disconnect it from the host:
    - On Windows, disable the virtual disk in the Device Manager, which might require a host reboot.
    - On Linux/UNIX, run the unmount command on the virtual.

Once the virtual disk is disconnected, you can continue with the restore and then enable and mount the restored virtual disk on the host.

**Format**

```
/prot/snap -id <value> restore
```

**Object qualifier**

| Qualifier | Description                                                                               |
|-----------|-------------------------------------------------------------------------------------------|
| -id       | Type the ID of the snapshot to which you want to restore the associated storage resource. |

**Example**

The following command restores snapshot SNAP\_1, which is a snapshot of generic iSCSI storage:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /prot/snap -id SNAP_1
restore
```

Operation completed successfully.

**Delete snapshots**

Delete (destroy) a snapshot of a storage resource.

**CAUTION**

**Once you delete a snapshot, you can no longer recover data from it or restore a storage resource to it.**

**Format**

```
/prot/snap -id <value> delete
```

**Object qualifier**

| Qualifier | Description                            |
|-----------|----------------------------------------|
| -id       | Type the ID of the snapshot to delete. |

**Example**

The following command deletes snapshot SNAP\_1:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /prot/snap -id SNAP_1 delete
```

Operation completed successfully.

## Manage replication sessions

Storage replication is a process in which storage data is duplicated either locally or to a remote network device. Replication produces a read-only, point-in-time copy of source storage data and periodically updates the copy, keeping it consistent with the source data. Storage replication provides an enhanced level of redundancy in case the main storage backup system fails. As a result:

- ◆ Downtime associated cost of a system failure is minimized.
- ◆ Recovery process from a natural or human-caused disaster is facilitated.

Replication provides easy-to-use asynchronous replication tools for creating point-in-time copies of storage resources. A replication session establishes an end-to-end path for a replication operation between a source and destination. The replication source and destination may be remote or local. The session establishes the path that the data follows as it moves from source to destination.

Each replication session is identified by an ID. The Unisphere online help provides more details about storage replication.


Table 43 on page 192 lists the attributes for replication sessions.

**Table 43 Replication session attributes**

| Attribute       | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|-----------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ID              | ID of the session.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Synchronization | Type of synchronization. Value is one of the following: <ul style="list-style-type: none"> <li>• manual — Data is replicated when manually initiated in the CLI or Unisphere.</li> <li>• auto — Data is replicated automatically in order to maintain the appropriate Recovery Point Objective (RPO). As the RPO increases, the potential for data loss also increases, as well as the amount of required protection space. Lowering the RPO will reduce the amount of potential data loss, but will also increase network traffic and may negatively impact performance. The default RPO is one hour.</li> </ul> |
| RPO             | Recovery Point Objective (RPO) interval for automatic synchronization.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Session type    | Storage type of the session. Value is one of the following: <ul style="list-style-type: none"> <li>• net — File-based storage, such as shared folder storage.</li> <li>• iscsi — iSCSI storage.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                        |
| Resource type   | Type of storage resource to which the replication session is applied.<br><br>Note that as of this writing, only file-based replication is supported. However, this parameter exists in output, so all sessions will have a “net” value.                                                                                                                                                                                                                                                                                                                                                                           |
| State           | State of the session. Value is one of the following: <ul style="list-style-type: none"> <li>• idle — Session is not currently synchronizing.</li> <li>• manual syncing — A user has started the synchronization of the source and the destination.</li> <li>• auto syncing — Session is automatically synchronizing the source and the destination.</li> </ul>                                                                                                                                                                                                                                                    |



**Table 43** Replication session attributes

| Attribute          | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|--------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Health state       | <p>Health state of the session. Value is one of the following:</p> <ul style="list-style-type: none"> <li>• OK — Session is operating normally.</li> <li>• Degraded/Warning — Session is currently paused.</li> <li>• Minor failure — An error has caused one or more of the following: <ul style="list-style-type: none"> <li>- Session has stopped. You can try to resume a stopped replication session.</li> <li>- Session has failed over, likely due to the source storage resource becoming unavailable. The destination storage resource is now in a read/write state. Review the state of the source and check your network connections for any problems. Once the source is back online, you can fail back the session to return it to normal operation. <a href="#">Fail back replication sessions on page 200</a> explains how to fail back replication sessions that have failed over.</li> <li>- Communication with the replication host has been lost. It is likely that the system is either powered down or there is a network connectivity issue between the systems. A change in the network configuration on either side could also interrupt communication.</li> </ul> </li> </ul> <p> <b>CAUTION</b></p> <p><b>If the replication session is in an error state, the session will not be recoverable. You will need to delete the session and create a new replication session.</b></p>                                                                                                                                     |
| Operational status | Operational status of the session. The operational status code appears in parentheses.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Network status     | <p>Status of the network connection. Value is one of the following:</p> <ul style="list-style-type: none"> <li>• Unknown — Network status is currently unknown. If you continue to see this value, check the network connections.</li> <li>• OK — Network connection is operating normally.</li> <li>• Lost Communication — Communication with the replication host has been lost. It is likely that the system is either powered down or there is a network connectivity issue between the systems. A change in the network configuration on either side could also interrupt communication.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Source status      | <p>Status of the source storage resource in the session. Value is one of the following:</p> <ul style="list-style-type: none"> <li>• Unknown — Source status is unknown.</li> <li>• OK — Source is operating normally.</li> <li>• Paused — Replication session for the source is currently paused.</li> <li>• Fatal replication issue — Source has experienced a critical error and the replication session has stopped. Delete the replication session and re-create it.</li> <li>• Lost communication — Communication with the replication host has been lost. It is likely that the system is either powered down or there is a network connectivity issue between the systems. A change in the network configuration on either side could also interrupt communication.</li> <li>• Failed over — The replication session has failed over to the destination site. In a failover state, the destination object is read/write. When communication is reestablished between the source and destination, the source becomes read-only. To resume operations on the source site, the replication session needs to be failed back. <a href="#">Fail back replication sessions on page 200</a> explains how to fail back replication sessions that have failed over.</li> <li>• Switched over — The replication session has been switched over. A switch over operation synchronizes the destination object with the source and stops replication session with no data loss. In a switch over state, the destination status is read/write and the source is read-only. The direction of the replication does not change.</li> </ul> |

**Table 43 Replication session attributes**

| Attribute             | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|-----------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Destination status    | <p>Status of the destination storage resource in the session. Value is one of the following:</p> <ul style="list-style-type: none"> <li>Unknown — Status of the destination resource is unknown.</li> <li>OK — Destination resource is operating normally.</li> <li>Paused — Replication session for destination resource is currently paused.</li> <li>Fatal replication issue — Destination has experienced a critical error and the replication session has stopped. Delete the replication session and re-create it.</li> <li>Lost communication — Communication with the replication host has been lost. It is likely that the system is either powered down or there is a network connectivity issue between the systems. A change in the network configuration on either side could also interrupt communication.</li> <li>Failed over — The replication session has failed over to the destination site. In a failover state, the destination object is read/write. When communication is reestablished between the source and destination, the source becomes read-only. To resume operations on the source site, the replication session needs to be failed back. <a href="#">Fail back replication sessions on page 200</a> explains how to fail back replication sessions that have failed over.</li> <li>Switched over — The replication session has been switched over. A switch over operation synchronizes the destination object with the source and stops replication session with no data loss. In a switch over state, the destination status is read/write and the source is read-only. The direction of the replication does not change.</li> </ul> |
| Source resource       | ID of the storage resource that is the source of the session. The source can be local or remote.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Source interface      | ID of the interface associated with the source storage resource of the session.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Destination type      | <p>Type of destination used in the session. Value is one of the following:</p> <ul style="list-style-type: none"> <li>local — Maintain a full copy of the storage resource on the local system. This has advantages over snapshots in that a full copy, not just a copy of changes, is retained.</li> <li>remote — Maintain a full copy of the storage resource on a remote system by transferring the data over the network. Remote replication is often used to ensure that a copy is available at a remote site in case of catastrophic data loss, for example, due to natural disaster at the local site.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Destination system    | For remote sessions, the ID of the remote system on which the data is replicated.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Destination resource  | ID of the storage resource on which the data is replicated.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Destination interface | For remote sessions, the ID of the interface used on the remote system.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Time of last sync     | Date and time of the last replication synchronization.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Sync status           | Percentage of the replication synchronization that has completed and the amount of time remaining.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Sync transfer rate    | Data transfer rate during a replication synchronization.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Paused                | Indication of whether the session is currently paused. Value is yes or no.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |

## Create replication sessions

Create a local or remote replication session.

### Prerequisites

Before creating a replication session, complete the following configuration tasks:

- ◆ Create the storage resource that provides the replication source. [Create shared folders on page 141](#) explains how to configure shared folders and [Create NFS datastores on page 168](#) explains how to create VMware NFS data stores.
- ◆ For local replication, create a replication destination on a local VNXe system. [Create shared folders on page 141](#) explains how to configure shared folders and [Create NFS datastores on page 168](#) explains how to create VMware NFS data stores.
- ◆ For remote replication, create a replication connection to a remote VNXe or Celerra/VNX, and create a replication destination on that remote system.

### Format

```
/prot/rep/session create -srcRes <value> [-srcInterface <value>] -dstType
{local|remote -dstSys <value>} -dstRes <value> [-dstInterface <value>]
[-syncType {manual [-autoInitiate {yes|no}]}|auto -rpo <value>]}
```

## Action qualifiers

| Qualifier     | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|---------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| -srcRes       | Type the ID of the storage resource to use as the source.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| -srcInterface | Type the ID of the interface used on the local system for replication.<br><br><b>Note:</b> If you do not type an interface ID the system will identify the interface automatically.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| -dstType      | Specify the type of destination. Value is one of the following: <ul style="list-style-type: none"> <li>local — Maintain a full copy of the storage resource on the local system. This has advantages over snapshots in that a full copy, not just a copy of changes, is retained.</li> <li>remote — Maintain a full copy of the storage resource on a remote system by transferring the data over the network. Remote replication is often used to ensure that a copy is available at a remote site in case of catastrophic data loss, for example, due to natural disaster at the local site.</li> </ul>                                                                                                                                                                      |
| -dstSys       | For remote replication, type the ID of the destination system. <a href="#">View settings for remote storage systems on page 117</a> explains how to view the IDs of the remote system configuration on the local system.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| -dstRes       | Type the ID of the destination storage resource.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| -dstInterface | Type the ID of the interface used on the remote system for replication.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| -syncType     | Specify how the source and destination will synchronize. Value is one of the following: <ul style="list-style-type: none"> <li>manual — Data is replicated when manually initiated in the CLI or Unisphere. <a href="#">Manually synchronize replication sessions on page 198</a> explains how to manually synchronize replication sessions.</li> <li>auto — Data is replicated automatically in order to maintain the appropriate Recovery Point Objective (RPO). As the RPO increases, the potential for data loss also increases, as well as the amount of required protection space. Lowering the RPO will reduce the amount of potential data loss, but will also increase network traffic and may negatively impact performance. The default RPO is one hour.</li> </ul> |
| -autoInitiate | Specify whether the system will perform the first replication synchronization automatically. Value is yes or no.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| -rpo          | For automatic synchronization, type the time interval for when the synchronization will run. Use the following format:<br><HH> [ : MM]<br>where: <ul style="list-style-type: none"> <li>HH — Type the number of hours. Value range is 5 minutes to 24 hours (1 day).</li> <li>MM — Type the number of minutes, in 5 minute increments. Value range is 05–55.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                        |

### Example

The following command creates a replication session with these settings:

- ◆ Source storage resource is shared folder SF\_1.
- ◆ Destination system type is remote.
- ◆ Remote destination system is RS\_1.
- ◆ Remote storage resource is shared folder SF\_2.
- ◆ Synchronization type is automatic.
- ◆ Synchronization interval (RPO) is every 30 minutes.

The replication session receives ID REPS\_1:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /prot/rep/session create
 -srcRes SF_1 -dstType remote -dstSys RS_1 -dstRes SF_2 -syncType auto -rpo
 02h30
```

```
ID = REPS_1
Operation completed successfully.
```

## View replication sessions

View details about replication sessions. You can filter on the session ID.

**Note:** The [show action command](#) on page 18 explains how to change the output format.

### Format

```
/prot/rep/session [{-id <value>|-res <value>}] show
```

### Object qualifiers

| Qualifier | Description                                                                                    |
|-----------|------------------------------------------------------------------------------------------------|
| -id       | Type the ID of a replication session.                                                          |
| -res      | Type the ID of a local storage resource on the system to view the sessions associated with it. |

### Example

The following command displays all replication sessions on the system:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /prot/rep/session show
```

```
1: ID = REPS_1
 Session type = net
 Synchronization type = Automatic
 RPO = 2h 30m
 Health state = OK (5)
 Operational status = OK (0x2)
 Time of last sync = 2010-01-16 23:01
 Sync status = Idle
```

## Change replication session settings

Change the settings for a replication session.

### Format

```
/prot/rep/session -id <value> set [-paused {yes|no}] [-srcInterface <value>]
[-dstInterface <value>] [-syncType {manual|auto -rpo <value>}]
```

## Object qualifier

| Qualifier | Description                                       |
|-----------|---------------------------------------------------|
| -id       | Type the ID of the replication session to change. |

## Action qualifiers

| Qualifier     | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|---------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| -paused       | For automatic synchronization, specify to pause the session. Value is yes or no.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| -srcInterface | Type the ID of the interface used on the local system for replication.<br><br><b>Note:</b> If you do not type an interface ID the system identifies the interface automatically.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| -dstInterface | Type the ID of the interface used on the remote system for replication.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| -syncType     | Specify how the source and destination will synchronize. Value is one of the following: <ul style="list-style-type: none"> <li>• manual — Data is replicated when manually initiated in the CLI or Unisphere. <a href="#">Manually synchronize replication sessions on page 198</a> explains how to manually sync replication sessions.</li> <li>• auto — Data is replicated automatically in order to maintain the desired Recovery Point Objective (RPO). As the RPO increases, the potential for data loss also increases, as well as the amount of required protection space. Lowering the RPO will reduce the amount of potential data loss, but will also increase network traffic and may negatively impact performance. The default RPO is one hour.</li> </ul> |
| -rpo          | For automatic synchronization, type the time interval for when the synchronization will run. Use the following format:<br><HH> [ : MM]<br>where: <ul style="list-style-type: none"> <li>• HH — Type the number of hours. Range is 00–24 hours (1 day).</li> <li>• MM — Type the number of minutes, in 5 minute increments. Range is 05 to 55.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                |

## Example

The following command changes the source interface and destination interface for replication session REPS\_1:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /prot/rep/session -id REPS_1
set -srcInterface RI_1 -dstInterface RI_2
```

```
ID = REPS_1
```

```
Operation completed successfully.
```

## Manually synchronize replication sessions

Manually synchronize a replication session. The session must be configured for manual synchronize and will not work with automatic synchronization. [Create replication sessions on page 195](#) explains how to use the **-syncType** qualifier for specifying how you want to sync the replication session.

### Format

```
/prot/rep/session -id <value> sync
```

## Object qualifier

| Qualifier | Description                                            |
|-----------|--------------------------------------------------------|
| -id       | Type the ID of the replication session to synchronize. |

### Example

The following command initiates a manual resynchronization of replication session REPS\_1:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /prot/rep/session -id REPS_1
sync
```

Operation completed successfully.

## Delete replication sessions

Delete a replication session. The deletion process automatically synchronizes the source storage resource with the destination storage resource, makes both read/write, and then deletes the session. You can then connect a host to either storage resource.



### CAUTION

**Once you delete a replication session, data from the source storage resource will no longer be replicated on the destination, leaving the data unprotected.**

### Format

```
/prot/rep/session -id <value> delete
```

## Object qualifier

| Qualifier | Description                                       |
|-----------|---------------------------------------------------|
| -id       | Type the ID of the replication session to delete. |

### Example

The following command deletes replication session REPS\_1:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /prot/rep/session -id REPS_1
delete
```

Operation completed successfully.

## Switch over replication sessions

Perform a planned reversal of the replication session, in which the destination synchronizes with the source and the replication session stops with no data loss. After the switch over, the destination status is read/write and the source is read-only. The direction of the replication does not change. You must perform switch over operations from the source side of the replication session.

**Note:** To perform a replication switch over, both the source and destination ends of the session must be available.

### Format

```
/prot/rep/session -id <value> switchover
```

## Object qualifier

| Qualifier | Description                                                               |
|-----------|---------------------------------------------------------------------------|
| -id       | Type the ID of the replication session on which to perform a switch over. |

### Example

The following command performs a switch over on replication session REPS\_1:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /prot/rep/session -id REPS_1
switchover
```

Operation completed successfully.

## Fail over replication sessions

Perform a failover of a replication session, with possible data loss, in response to an emergency scenario in which the source becomes unavailable. After the failover, the destination is read/write. You fail back a session that is failed over to reestablished communication between the source and destination. [Fail back replication sessions on page 200](#) explains how to fail back a replication session that has failed over.

**Note:** Failover operations terminate the transfer of data if there is a transfer in progress, causing a potential loss of data. If the source site is still available when you perform a failover, the system attempts to change the source filesystem from read/write to read-only.

### Format

```
/prot/rep/session -id <value> failover
```

## Object qualifier

| Qualifier | Description                                          |
|-----------|------------------------------------------------------|
| -id       | Type the ID of the replication session to fail over. |

### Example

The following command performs a fail over of replication session REPS\_1:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /prot/rep/session -id REPS_1
failover
```

Operation completed successfully.

## Fail back replication sessions

Fail back a replication session that has failed over. A failback results in the following:

- ◆ Synchronizes the destination and source storage resources.
- ◆ Makes the destination storage resource read-only.
- ◆ Makes the source storage resource read/write.

When the failback operation is complete, the replication session will resume and you may connect your hosts to the source storage resource.



**CAUTION**

**Ensure that hosts do not write to the destination storage resource, which will become read-only.**

**Format**

```
/prot/rep/session -id <value> failback
```

**Object qualifier**

| Qualifier | Description                                          |
|-----------|------------------------------------------------------|
| -id       | Type the ID of the replication session to fail back. |

**Example**

The following command performs a fail back on replication session REPS\_1:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /prot/rep/session -id REPS_1
failback
```

Operation completed successfully.



# 8

## Manage Events and Alerts

This chapter addresses the following topics:

|                                              |     |
|----------------------------------------------|-----|
| View event logs and alerts .....             | 204 |
| View alert history .....                     | 206 |
| Configure alert settings .....               | 207 |
| Configure SNMP destinations for alerts ..... | 210 |

## View event logs and alerts

The system monitors and reports on a variety of system events. It collects the events and writes them to the user log. The log contains a record for each event. Some log entries generate alerts. Alerts are usually events that require attention from the system administrator and typically indicate a system problem. For example, you might receive an alert telling you that a disk has faulted, or that the system is low on storage capacity.

In Unisphere, events appear as messages and alerts. Unisphere CLI displays additional event attributes that provide more detailed event reports than what appear in Unisphere. [Configure alert settings on page 207](#) explains the commands for configuring alerts. The Unisphere online help provides more details on logs and alerts.

Each event record and alert is identified by an ID.

[Table 44 on page 204](#) lists the attributes for event records.

**Table 44 Event record attributes**

| Attribute   | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|-------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Message ID  | ID of the event record.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Description | Brief description of the event.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Severity    | Severity of the event. Value is one of the following: <ul style="list-style-type: none"> <li>critical — An error has occurred that has a significant impact on the system and should be remedied immediately.</li> <li>error — An error has occurred that has a minor impact on the system and should be remedied at some point but does not need to be fixed immediately.</li> <li>warning — An error has occurred that you should be aware of but has not had a significant impact on the system.</li> <li>info — Some event has occurred that does not have an impact on the functioning of the system.</li> </ul> |
| Time        | Date and time when the event occurred, in Greenwich Mean Time (GMT).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Node        | Name of the SP that generated the event. Value is SPA or SPB.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Process     | ID of the system process that generated the event.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Category    | Event category.<br><br><b>Note:</b> After a successful login to the system, when you run a command through the CLI, events that include the category attribute with the Authentication value will appear twice as there are separate events for successful login and authentication.                                                                                                                                                                                                                                                                                                                                  |
| Account     | User account of the user that caused the event. N/A appears if a user did not cause the event or the account is unavailable.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Component   | System component that caused the event. Intended for service personnel.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Product     | System product that caused the event. Intended for service personnel.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |

## View event records

View a detailed log of system events. Each event is a record in the log and each record is identified by an ID. You can display 100 event records at a time and filter on a range of times when the events were logged and the event severity.

**Note:** The [show action command on page 18](#) explains how to change the output format.

### Format

```
/event/log show [-fromTime <value>] [-toTime <value>] [-limit <value>]
 [-severity <value>]
```

### Action qualifiers

| Qualifier | Description                                                                                                                                                                                                                 |
|-----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| -fromTime | Type the beginning of the time interval for which to display event records. The format is YYYY-MM-DD HH:MM:SS.<br><br><b>Note:</b> If you omit this qualifier, the list of logs that appears will begin with the first log. |
| -toTime   | Type the end of the time interval for which to display event records. The format is YYYY-MM-DD HH:MM:SS.<br><br><b>Note:</b> If you omit this qualifier, the value is the current system time.                              |
| -limit    | Type the maximum number of records to display. The value cannot exceed the default number 100.                                                                                                                              |
| -severity | Type the minimum severity level of the events to display. For example, if you type <b>critical</b> , records for the alert and emergency severities will also appear.                                                       |

### Example

The following command lists all event logs generated on 11/09/2009 up to 23:59:59 GMT:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /event/log show -fromTime
 "2009-11-09 00:00:00.000" -to "2009-11-09 23:59:59.999"
```

```
1: Message ID = Login success
 Description = User admin authenticated in authority LocalDirectory/Local
 Severity = info
 Time = 2009-11-09 19:43:08.577
 Node = spa
 Account = unix/spa/root
 Component = Server
```

## View alert history

View a detailed list of all system alerts. The alert history clears each time the system reboots.

Table 45 on page 206 lists the attributes for alerts.

**Table 45 Alert attributes**

| Attribute | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|-----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Time      | Date and time (in GMT) when the alert occurred.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Message   | Alert message.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Severity  | Alert severity. Value is one of the following: <ul style="list-style-type: none"> <li>critical — An error has occurred that has a significant impact on the system and should be remedied immediately.</li> <li>error — An error has occurred that has a minor impact on the system and should be remedied at some point but does not need to be fixed immediately.</li> <li>warning — An error has occurred that you should be aware of but has not had a significant impact on the system.</li> <li>info — Some event has occurred that does not have an impact on the functioning of the system.</li> </ul> |

**Note:** The [show action command on page 18](#) explains how to change the output format.

### Format

```
/event/alert/hist show
```

### Example

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /event/alert/hist show
```

```
1: Time = 2009-11-09 19:43:08.577
 Message = Message text
 Severity = info

2: Time = 2009-11-09 19:55:18.321
 Message = Message text
 Severity = info
```

## Configure alert settings

Specify how the system handles alerts, which are notifications of system and user events. You can have the alerts sent directly to your service provider and e-mailed to specific addresses. You can also have the system send alerts as traps to an SNMP destination. [Configure SNMP destinations for alerts on page 210](#) provides more details on setting up a destination to receive alerts over SNMP. [View event logs and alerts on page 204](#) provides details about viewing the current logs and alerts.

**Note:** To send e-mail alerts, you must configure an SMTP server on the system as explained in [Manage SMTP server settings on page 94](#).

[Table 46 on page 207](#) lists the attributes for alerts.

**Table 46 Alert attributes**

| Attribute                 | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|---------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Enable ConnectEMC         | Indication of whether ConnectEMC is enabled. Value is yes or no.<br>ConnectEMC sends e-mail alerts to EMC service to help with resolving customer problems. This setting requires an SMTP server explained in <a href="#">Manage SMTP server settings on page 94</a> .                                                                                                                                                                                                                                                                                                                                                                                        |
| Language                  | Language in which the system sends e-mail alerts.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| E-mail from address       | E-mail address the system uses as the FROM address.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| E-mail to addresses       | Comma-separated list of e-mail addresses to send alerts.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| E-mail severity threshold | Minimal severity of alerts the system will send as e-mail. Value is one of the following: <ul style="list-style-type: none"> <li>critical — An error has occurred that has a significant impact on the system and should be remedied immediately.</li> <li>error — An error has occurred that has a minor impact on the system and should be remedied at some point but does not have to be fixed immediately.</li> <li>warning — An error has occurred that you should be aware of but has not had a significant impact on the system.</li> <li>info — Some event has occurred that does not have an impact on the functioning of the system.</li> </ul>     |
| SNMP severity threshold   | Minimal severity of alerts the system will send as SNMP traps. Value is one of the following: <ul style="list-style-type: none"> <li>critical — An error has occurred that has a significant impact on the system and should be remedied immediately.</li> <li>error — An error has occurred that has a minor impact on the system and should be remedied at some point but does not have to be fixed immediately.</li> <li>warning — An error has occurred that you should be aware of but has not had a significant impact on the system.</li> <li>info — Some event has occurred that does not have an impact on the functioning of the system.</li> </ul> |
| SNMP version              | Version of SNMP that the destination is running.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| SNMP engine ID            | SNMP engine ID for the SNMP destination.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |

## View alert settings

View the settings for how the system handles alerts.

**Note:** The [show action command on page 18](#) explains how to change the output format.

### Format

```
/event/alert/conf show
```

### Example

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /event/alert/conf show
```

```
1: Enable ConnectEMC = no
 Language = english
 E-mail from address = me@mail.com
 E-mail to addresses = Local/joe@mail.com,rick@mail.com
 E-mail severity threshold = Info
 SNMP severity threshold = Info
 SNMP version = 3.0
 SNMP engine ID =
```

## Configure alert settings

Configure the settings for how the system handles alerts.

**Note:** For e-mail alerts to work, you must configure an SMTP server on the system, as explained in [Manage SMTP server settings on page 94](#).

### Format

```
event/alert/conf set [-enableConnectEMC {yes|no}] [-emailFromAddr <value>]
 [-emailToAddr <value>] [-emailSeverity {critical|error|warning|info}]
 [-snmpSeverity {critical|error|warning|info}]
```

### Action qualifiers

| Qualifier         | Description                                                                                                                                         |
|-------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------|
| -enableConnectEMC | Enable the system to send e-mail alerts to EMC service. Value is yes or no.                                                                         |
| -emailFromAddr    | Type the e-mail address the system will use as the FROM address. The addresses will appear in the FROM field of the recipient's e-mail application. |
| -emailToAddr      | Type a comma-separated list of e-mail addresses the system will send alerts.                                                                        |
| -emailSeverity    | Specify the minimal severity of alerts the system will send as e-mails. Value is critical, error, warning, or info.                                 |
| -snmpSeverity     | Specify the minimal severity of alerts the system will send as SNMP traps.                                                                          |



**Example**

The following command changes these alert settings:

- ◆ Connect EMC is enabled.
- ◆ FROM address is admin@mail.com.
- ◆ TO addresses are jason@mail.com and pete@mail.com.
- ◆ Minimum alert severity for sending e-mail alerts is info.
- ◆ Minimum alert severity for sending alerts as SNMP traps is error.

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /event/alert/conf set
-enableConnectEMC yes -emailFromAddr me@mail.com -emailToAddrs
"jason@mail.com,pete@mail.com" -emailSeverity info -snmpSeverity error
```

Operation completed successfully.

## Configure SNMP destinations for alerts

The system uses the Simple Network Management Protocol (SNMP) to transfer system alerts as traps to an SNMP destination host. Traps are asynchronous messages that notify the SNMP destination when system and user events occur. The three types of traps are:

- ◆ Information — Provide routine status information about system operation.
- ◆ Warnings — Indicate that a problem has occurred or may occur.
- ◆ Errors — Report system problems that occurred or are occurring.

You can configure the types of alert information the system reports (informational, error, or emergency indications).

Each SNMP destination is identified by an ID.

[Table 47 on page 210](#) lists the attributes for SNMP destinations.

**Table 47** SNMP destination attributes

| Attribute        | Description                                                                                                                                                                                                                                                                                                  |
|------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ID               | ID of the SNMP destination.                                                                                                                                                                                                                                                                                  |
| Host             | Hostname or IP address of the SNMP destination.                                                                                                                                                                                                                                                              |
| Port             | Host port on the SNMP destination that will receive the traps.                                                                                                                                                                                                                                               |
| User name        | Username that is used to access the SNMP destination.                                                                                                                                                                                                                                                        |
| Auth protocol    | Protocol that is used to authenticate access to the SNMP destination. Value is one of the following: <ul style="list-style-type: none"><li>• none — No authentication</li><li>• md5 — Message-Digest algorithm 5</li><li>• sha — Secure Hash Algorithm</li></ul>                                             |
| Auth password    | Authentication password for accessing the SNMP destination.                                                                                                                                                                                                                                                  |
| Privacy protocol | Protocol that is used to enable privacy on the SNMP destination. The privacy protocol encrypts the SNMP packets. Value is one of the following: <ul style="list-style-type: none"><li>• none — No encryption</li><li>• aes — Advanced Encryption Standard</li><li>• des — Data Encryption Standard</li></ul> |
| Privacy password | Privacy password for the privacy protocol.                                                                                                                                                                                                                                                                   |

## Create SNMP destinations

Create an SNMP destination to send alerts as traps.

### Format

```
/event/alert/snmp create -host <value> -port <value> -userName <value>
[-authProto {none|md5 -authPassword <value> [-privProto {none|aes
-privPassword <value>|des privPassword <value>}}] |sha -authPassword <value>
[-privProto {none|aes -privPassword <value>|des -privPassword <value>}}}]
```

### Action qualifiers

| Qualifier     | Description                                                                                                                                                                                                                                                                      |
|---------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| -host         | Type a hostname or IP address of the SNMP destination.                                                                                                                                                                                                                           |
| -port         | Type the host port on the SNMP destination that will receive the traps.                                                                                                                                                                                                          |
| -userName     | Type the username that is used to access the SNMP destination.                                                                                                                                                                                                                   |
| -authProto    | Specify the protocol that is used to authenticate access to the SNMP destination. Value is one of the following: <ul style="list-style-type: none"> <li>• none — No authentication</li> <li>• md5 — Message-Digest algorithm 5</li> <li>• sha — Secure Hash Algorithm</li> </ul> |
| -authPassword | Type the authentication password.                                                                                                                                                                                                                                                |
| -privProto    | Specify the protocol that is used to enable privacy on the SNMP destination. Value is one of the following: <ul style="list-style-type: none"> <li>• none — No encryption</li> <li>• aes — Advanced Encryption Standard</li> <li>• des — Data Encryption Standard</li> </ul>     |
| -privPassword | Type the privacy password.                                                                                                                                                                                                                                                       |

### Example

The following command creates an SNMP destination with these settings:

- ◆ Host IP is 10.64.75.1.
- ◆ Host port is 333.
- ◆ Username is user1.
- ◆ Authorization protocol is md5.
- ◆ Authorization password is authpassword1234.
- ◆ Privacy protocol is des.
- ◆ Privacy password is privpassword321.

The SNMP destination receives ID Host1\_333:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /event/alert/snmp create
-host 10.64.75.1 -port 333 -userName user1 authProto md5 -authPassword
authpassword1234 -privProto des -privPassword privpassword321
```

ID = Host1\_333

Operation completed successfully.

## View SNMP destinations

View details about SNMP destinations. You can filter on the SNMP destination ID.

**Note:** The [show action command on page 18](#) provides more details on changing the output format.

### Format

```
/event/alert/snmp [-id <value>] show
```

### Object qualifier

| Qualifier | Description                         |
|-----------|-------------------------------------|
| -id       | Type the ID of an SNMP destination. |

### Example

The following command lists all SNMP destinations:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /event/alert/snmp show
```

```
1: ID = Host1_323
 Host = Host1
 Port = 323
 User name = user1
 Auth protocol = md5
 Privacy protocol = aes
```

## Change SNMP destination settings

Change the settings for an SNMP destination.

### Format

```
/event/alert/snmp -id <value> set [-host <value>] [-port <value>] [-userName
<value>] [-authProto {none|md5 -authPassword <value> [-privProto {none|aes
-privPassword <value>|des -privPassword <value>}}|sha -authPassword <value>
[-privProto {none|aes -privPassword <value>|des -privPassword <value>}}]]
```

## Object qualifier

| Qualifier | Description                                    |
|-----------|------------------------------------------------|
| -id       | Type the ID of the SNMP destination to change. |

## Action qualifiers

| Qualifier     | Description                                                                                                                                                                                                                                                                      |
|---------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| -host         | Type a hostname or IP address of the SNMP destination.                                                                                                                                                                                                                           |
| -port         | Type the host port on the SNMP destination that will receive the traps.                                                                                                                                                                                                          |
| -userName     | Type the username that is used to access the SNMP destination.                                                                                                                                                                                                                   |
| -authProto    | Specify the protocol that is used to authenticate access to the SNMP destination. Value is one of the following: <ul style="list-style-type: none"> <li>• none — No authentication</li> <li>• md5 — Message-Digest algorithm 5</li> <li>• sha — Secure Hash Algorithm</li> </ul> |
| -authPassword | Type the authentication password.                                                                                                                                                                                                                                                |
| -privProto    | Specify the protocol that is used to enable privacy on the SNMP destination. Value is one of the following: <ul style="list-style-type: none"> <li>• none — No encryption</li> <li>• aes — Advanced Encryption Standard</li> <li>• des — Data Encryption Standard</li> </ul>     |
| -privPassword | Type the privacy password.                                                                                                                                                                                                                                                       |

## Example

The following command changes the authorization protocol, privacy protocol, authorization password, and privacy password for SNMP destination Host1\_323:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /event/alert/snmp -id
Host1_323 set authProto md5 -authPassword newauthpassword -privProto des
-privPassword newprivpassword
```

ID = Host1\_323

Operation completed successfully.

## Delete SNMP destinations

Delete an SNMP destination.

**Note:** If you delete an SNMP destination, the system will stop sending alerts to it as traps.

## Format

```
/event/alert/snmp -id <value> delete
```

**Object qualifier**

| Qualifier | Description                                   |
|-----------|-----------------------------------------------|
| -id       | Type the ID of an SNMP destination to delete. |

**Example**

The following command deletes SNMP destination Host1\_323:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /event/alert/snmp -id
Host1_323 delete
```

Operation completed successfully.

# 9

## Service the System

This chapter addresses the following topics:

|                                             |     |
|---------------------------------------------|-----|
| Change the Service password.....            | 216 |
| Manage I/O modules .....                    | 217 |
| View event records .....                    | 219 |
| View alert history.....                     | 220 |
| Configure alert settings.....               | 221 |
| Configure SNMP destinations for alerts..... | 224 |

# Change the Service password

**Note:** Install Service Pack 3 (SP3) or higher of the system management software to use this functionality.

The system ships with a default Service password for performing service actions on the system. After you change the password, the old Service password will not work.

## Prerequisite

Both Storage Processors (SPs) must be present in the system and their boot mode must be Normal Mode. If you have removed an SP or an SP has failed, you must replace the SP before you can change the Service password.

## Format

```
/service/user set -passwd <value> -oldpasswd <value>
```

## Action qualifiers

| Qualifier  | Description                                                                                                                                                                                                                                                                                                                                                                                                            |
|------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| -passwd    | Type a new Service password.<br>The following are the password requirements: <ul style="list-style-type: none"><li>• Passwords must be 8 to 40 characters in length and cannot contain spaces.</li><li>• Passwords must include mixed case, a number, and a special character from this list:<br/>!, @, #, \$, %, ^, *, ?, _ ~</li><li>• When changing a password, do not reuse any of the last 3 passwords.</li></ul> |
| -oldpasswd | Type the old password to set the new password.                                                                                                                                                                                                                                                                                                                                                                         |

## Example

The following command changes the Service password:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /service/user set -passwd
NewPassword456! -oldpasswd OldPassword456!
```

Operation completed successfully.



## Manage I/O modules

**Note:** Install Service Pack 3 (SP3) or higher of the system management software to use this functionality.

I/O modules provide connectivity between the SPs and the disk-array enclosure. You can view details about each I/O module installed in the system, such as the health state. Commit a newly added I/O module to configure it for use by the system.

Each I/O module record and alert is identified by an ID.

[Table 48 on page 217](#) lists the attributes for I/O modules.

**Table 48 I/O module attributes**

| Attribute     | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|---------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ID            | ID of the I/O module.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| SP            | ID of the SP to which the I/O module is connected.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| Slot          | Disk-processor enclosure (DPE) slot in which the I/O module is installed.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Name          | Name of the I/O module.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Health state  | Health state of the I/O module. The health state code appears in parentheses. Value is one of the following: <ul style="list-style-type: none"> <li>Unknown (0) — Unable to determine the health of the I/O module.</li> <li>OK (5) — I/O module is operating normally.</li> <li>Degraded/Warning (10) — I/O module has not been committed (configured). <a href="#">Commit I/O modules on page 217</a> explains how to commit an I/O module.</li> <li>Minor failure (15) — One or both of the following may have occurred:               <ul style="list-style-type: none"> <li>I/O module has not been committed (configured) after a rebooting the SP.</li> <li>I/O module is installed in the wrong slot.</li> </ul> </li> <li>Major failure (20) — One or both of the following may have occurred:               <ul style="list-style-type: none"> <li>I/O module has been removed. Re-install the I/O module.</li> <li>I/O module has faulted and needs to be replaced. The Unisphere online help explains how to order a replacement I/O module.</li> <li>I/O module is misconfigured. Commit the I/O module to re-configure it.</li> </ul> </li> </ul> |
| Part number   | EMC Part Number on the I/O module.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| Serial number | EMC Serial Number on the I/O module.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Model         | Model of the I/O module.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |

## Commit I/O modules

When you add a new I/O module to the system, you must first commit it before the system can use it. The system automatically commits unconfigured I/O modules.

### Format

```
/env/iomodule commit
```

### Example

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /env/iomodule commit
```

Operation completed successfully.

## View I/O modules

View details about I/O modules in the system. You can filter on the I/O module ID.

**Note:** The [show action command on page 18](#) provides more details on changing the output format.

### Format

```
/env/iomodule [-id <value>] show
```

### Object qualifier

| Qualifier | Description                    |
|-----------|--------------------------------|
| -id       | Enter the ID of an I/O module. |

### Example

The following command displays details about the two I/O modules in the system:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /env/iomodule show
```

```
1: ID = IO_SPA_0
 SP = SPA
 Slot = 0
 Health state = OK (5)

2: ID = IO_SPA_1
 SP = SPA
 Slot = 1
 Health state = Degraded/Warning (10)
```

Operation completed successfully.

## View event records

View a detailed log of system events. Each event is a record in the log and each record is identified by an ID. You can display 100 event records at a time and filter on a range of times when the events were logged and the event severity.

**Note:** The [show action command on page 18](#) explains how to change the output format.

### Format

```
/event/log show [-fromTime <value>] [-toTime <value>] [-limit <value>]
 [-severity <value>]
```

### Action qualifiers

| Qualifier | Description                                                                                                                                                                                                                 |
|-----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| -fromTime | Type the beginning of the time interval for which to display event records. The format is YYYY-MM-DD HH:MM:SS.<br><br><b>Note:</b> If you omit this qualifier, the list of logs that appears will begin with the first log. |
| -toTime   | Type the end of the time interval for which to display event records. The format is YYYY-MM-DD HH:MM:SS.<br><br><b>Note:</b> If you omit this qualifier, the value is the current system time.                              |
| -limit    | Type the maximum number of records to display. The value cannot exceed the default number 100.                                                                                                                              |
| -severity | Type the minimum severity level of the events to display. For example, if you type <b>critical</b> , records for the alert and emergency severities will also appear.                                                       |

### Example

The following command lists all event logs generated on 11/09/2009 up to 23:59:59 GMT:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /event/log show -fromTime
"2009-11-09 00:00:00.000" -to "2009-11-09 23:59:59.999"
```

```
1: Message ID = Login success
 Description = User admin authenticated in authority LocalDirectory/Local
 Severity = info
 Time = 2009-11-09 19:43:08.577
 Node = spa
 Account = unix/spa/root
 Component = Server
```

## View alert history

View a detailed list of all system alerts. The alert history clears each time the system reboots.

Table 49 on page 220 lists the attributes for alerts.

**Table 49 Alert attributes**

| Attribute | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|-----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Time      | Date and time (in GMT) when the alert occurred.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Message   | Alert message.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Severity  | Alert severity. Value is one of the following: <ul style="list-style-type: none"> <li>critical — An error has occurred that has a significant impact on the system and should be remedied immediately.</li> <li>error — An error has occurred that has a minor impact on the system and should be remedied at some point but does not need to be fixed immediately.</li> <li>warning — An error has occurred that you should be aware of but has not had a significant impact on the system.</li> <li>info — Some event has occurred that does not have an impact on the functioning of the system.</li> </ul> |

**Note:** The [show action command on page 18](#) explains how to change the output format.

### Format

```
/event/alert/hist show
```

### Example

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /event/alert/hist show
```

```
1: Time = 2009-11-09 19:43:08.577
 Message = Message text
 Severity = info

2: Time = 2009-11-09 19:55:18.321
 Message = Message text
 Severity = info
```

## Configure alert settings

Specify how the system handles alerts, which are notifications of system and user events. You can have the alerts sent directly to your service provider and e-mailed to specific addresses. You can also have the system send alerts as traps to an SNMP destination. [Configure SNMP destinations for alerts on page 224](#) provides more details on setting up a destination to receive alerts over SNMP. [Manage I/O modules on page 217](#) provides details about viewing the current logs and alerts.

**Note:** To send e-mail alerts, you must configure an SMTP server on the system as explained in [Manage SMTP server settings on page 94](#).

[Table 50 on page 221](#) lists the attributes for alerts.

**Table 50 Alert attributes**

| Attribute                 | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|---------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Enable ConnectEMC         | Indication of whether ConnectEMC is enabled. Value is yes or no.<br>ConnectEMC sends e-mail alerts to EMC service to help with resolving customer problems. This setting requires an SMTP server explained in <a href="#">Manage SMTP server settings on page 94</a> .                                                                                                                                                                                                                                                                                                                                                                                        |
| Language                  | Language in which the system sends e-mail alerts.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| E-mail from address       | E-mail address the system uses as the FROM address.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| E-mail to addresses       | Comma-separated list of e-mail addresses to send alerts.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| E-mail severity threshold | Minimal severity of alerts the system will send as e-mail. Value is one of the following: <ul style="list-style-type: none"> <li>critical — An error has occurred that has a significant impact on the system and should be remedied immediately.</li> <li>error — An error has occurred that has a minor impact on the system and should be remedied at some point but does not have to be fixed immediately.</li> <li>warning — An error has occurred that you should be aware of but has not had a significant impact on the system.</li> <li>info — Some event has occurred that does not have an impact on the functioning of the system.</li> </ul>     |
| SNMP severity threshold   | Minimal severity of alerts the system will send as SNMP traps. Value is one of the following: <ul style="list-style-type: none"> <li>critical — An error has occurred that has a significant impact on the system and should be remedied immediately.</li> <li>error — An error has occurred that has a minor impact on the system and should be remedied at some point but does not have to be fixed immediately.</li> <li>warning — An error has occurred that you should be aware of but has not had a significant impact on the system.</li> <li>info — Some event has occurred that does not have an impact on the functioning of the system.</li> </ul> |
| SNMP version              | Version of SNMP that the destination is running.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| SNMP engine ID            | SNMP engine ID for the SNMP destination.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |

## View alert settings

View the settings for how the system handles alerts.

**Note:** The [show action command on page 18](#) explains how to change the output format.

### Format

```
/event/alert/conf show
```

### Example

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /event/alert/conf show
```

```
1: Enable ConnectEMC = no
 Language = english
 E-mail from address = me@mail.com
 E-mail to addresses = Local/joe@mail.com,rick@mail.com
 E-mail severity threshold = Info
 SNMP severity threshold = Info
 SNMP version = 3.0
 SNMP engine ID =
```

## Configure alert settings

Configure the settings for how the system handles alerts.

**Note:** For e-mail alerts to work, you must configure an SMTP server on the system, as explained in [Manage SMTP server settings on page 94](#).

### Format

```
event/alert/conf set [-enableConnectEMC {yes|no}] [-emailFromAddr <value>]
 [-emailToAddr <value>] [-emailSeverity {critical|error|warning|info}]
 [-snmpSeverity {critical|error|warning|info}]
```

### Action qualifiers

| Qualifier         | Description                                                                                                                                         |
|-------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------|
| -enableConnectEMC | Enable the system to send e-mail alerts to EMC service. Value is yes or no.                                                                         |
| -emailFromAddr    | Type the e-mail address the system will use as the FROM address. The addresses will appear in the FROM field of the recipient's e-mail application. |
| -emailToAddr      | Type a comma-separated list of e-mail addresses the system will send alerts.                                                                        |
| -emailSeverity    | Specify the minimal severity of alerts the system will send as e-mails. Value is critical, error, warning, or info.                                 |
| -snmpSeverity     | Specify the minimal severity of alerts the system will send as SNMP traps.                                                                          |

**Example**

The following command changes these alert settings:

- ◆ Connect EMC is enabled.
- ◆ FROM address is admin@mail.com.
- ◆ TO addresses are jason@mail.com and pete@mail.com.
- ◆ Minimum alert severity for sending e-mail alerts is info.
- ◆ Minimum alert severity for sending alerts as SNMP traps is error.

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /event/alert/conf set
-enableConnectEMC yes -emailFromAddr admin@mail.com -emailToAddrs
"jason@mail.com,pete@mail.com" -emailSeverity info -snmpSeverity error
```

Operation completed successfully.

## Configure SNMP destinations for alerts

The system uses the Simple Network Management Protocol (SNMP) to transfer system alerts as traps to an SNMP destination host. Traps are asynchronous messages that notify the SNMP destination when system and user events occur. The three types of traps are:

- ◆ Information — Provide routine status information about system operation.
- ◆ Warnings — Indicate that a problem has occurred or may occur.
- ◆ Errors — Report system problems that occurred or are occurring.

You can configure the types of alert information the system reports (informational, error, or emergency indications).

Each SNMP destination is identified by an ID.

[Table 51 on page 224](#) lists the attributes for SNMP destinations.

**Table 51** SNMP destination attributes

| Attribute        | Description                                                                                                                                                                                                                                                                                                  |
|------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ID               | ID of the SNMP destination.                                                                                                                                                                                                                                                                                  |
| Host             | Hostname or IP address of the SNMP destination.                                                                                                                                                                                                                                                              |
| Port             | Host port on the SNMP destination that will receive the traps.                                                                                                                                                                                                                                               |
| User name        | Username that is used to access the SNMP destination.                                                                                                                                                                                                                                                        |
| Auth protocol    | Protocol that is used to authenticate access to the SNMP destination. Value is one of the following: <ul style="list-style-type: none"><li>• none — No authentication</li><li>• md5 — Message-Digest algorithm 5</li><li>• sha — Secure Hash Algorithm</li></ul>                                             |
| Auth password    | Authentication password for accessing the SNMP destination.                                                                                                                                                                                                                                                  |
| Privacy protocol | Protocol that is used to enable privacy on the SNMP destination. The privacy protocol encrypts the SNMP packets. Value is one of the following: <ul style="list-style-type: none"><li>• none — No encryption</li><li>• aes — Advanced Encryption Standard</li><li>• des — Data Encryption Standard</li></ul> |
| Privacy password | Privacy password for the privacy protocol.                                                                                                                                                                                                                                                                   |



## Create SNMP destinations

Create an SNMP destination to send alerts as traps.

### Format

```
/event/alert/snmp create -host <value> -port <value> -userName <value>
[-authProto {none|md5 -authPassword <value> [-privProto {none|aes
-privPassword <value>|des privPassword <value>}}] |sha -authPassword <value>
[-privProto {none|aes -privPassword <value>|des -privPassword <value>}}]]
```

### Action qualifiers

| Qualifier     | Description                                                                                                                                                                                                                                                                      |
|---------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| -host         | Type a hostname or IP address of the SNMP destination.                                                                                                                                                                                                                           |
| -port         | Type the host port on the SNMP destination that will receive the traps.                                                                                                                                                                                                          |
| -userName     | Type the username that is used to access the SNMP destination.                                                                                                                                                                                                                   |
| -authProto    | Specify the protocol that is used to authenticate access to the SNMP destination. Value is one of the following: <ul style="list-style-type: none"> <li>• none — No authentication</li> <li>• md5 — Message-Digest algorithm 5</li> <li>• sha — Secure Hash Algorithm</li> </ul> |
| -authPassword | Type the authentication password.                                                                                                                                                                                                                                                |
| -privProto    | Specify the protocol that is used to enable privacy on the SNMP destination. Value is one of the following: <ul style="list-style-type: none"> <li>• none — No encryption</li> <li>• aes — Advanced Encryption Standard</li> <li>• des — Data Encryption Standard</li> </ul>     |
| -privPassword | Type the privacy password.                                                                                                                                                                                                                                                       |

### Example

The following command creates an SNMP destination with these settings:

- ◆ Host IP is 10.64.75.1.
- ◆ Host port is 333.
- ◆ Username is user1.
- ◆ Authorization protocol is md5.
- ◆ Authorization password is authpassword1234.
- ◆ Privacy protocol is des.
- ◆ Privacy password is privpassword321.

The SNMP destination receives ID Host1\_333:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /event/alert/snmp create
-host 10.64.75.1 -port 333 -userName user1 authProto md5 -authPassword
authpassword1234 -privProto des -privPassword privpassword321
```

ID = Host1\_333

Operation completed successfully.

## View SNMP destinations

View details about SNMP destinations. You can filter on the SNMP destination ID.

**Note:** The [show action command on page 18](#) provides more details on changing the output format.

### Format

```
/event/alert/snmp [-id <value>] show
```

### Object qualifier

| Qualifier | Description                         |
|-----------|-------------------------------------|
| -id       | Type the ID of an SNMP destination. |

### Example

The following command lists all SNMP destinations:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /event/alert/snmp show
```

```
1: ID = Host1_323
 Host = Host1
 Port = 323
 User name = user1
 Auth protocol = md5
 Privacy protocol = aes
```

## Change SNMP destination settings

Change the settings for an SNMP destination.

### Format

```
/event/alert/snmp -id <value> set [-host <value>] [-port <value>] [-userName
 <value>] [-authProto {none|md5 -authPassword <value> [-privProto {none|aes
 -privPassword <value>|des -privPassword <value>}}|sha -authPassword <value>
 [-privProto {none|aes -privPassword <value>|des -privPassword <value>}}]]
```

## Object qualifier

| Qualifier | Description                                    |
|-----------|------------------------------------------------|
| -id       | Type the ID of the SNMP destination to change. |

## Action qualifiers

| Qualifier     | Description                                                                                                                                                                                                                                                                      |
|---------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| -host         | Type a hostname or IP address of the SNMP destination.                                                                                                                                                                                                                           |
| -port         | Type the host port on the SNMP destination that will receive the traps.                                                                                                                                                                                                          |
| -userName     | Type the username that is used to access the SNMP destination.                                                                                                                                                                                                                   |
| -authProto    | Specify the protocol that is used to authenticate access to the SNMP destination. Value is one of the following: <ul style="list-style-type: none"> <li>• none — No authentication</li> <li>• md5 — Message-Digest algorithm 5</li> <li>• sha — Secure Hash Algorithm</li> </ul> |
| -authPassword | Type the authentication password.                                                                                                                                                                                                                                                |
| -privProto    | Specify the protocol that is used to enable privacy on the SNMP destination. Value is one of the following: <ul style="list-style-type: none"> <li>• none — No encryption</li> <li>• aes — Advanced Encryption Standard</li> <li>• des — Data Encryption Standard</li> </ul>     |
| -privPassword | Type the privacy password.                                                                                                                                                                                                                                                       |

## Example

The following command changes the authorization protocol, privacy protocol, authorization password, and privacy password for SNMP destination Host1\_323:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /event/alert/snmp -id
Host1_323 set authProto md5 -authPassword newauthpassword -privProto des
-privPassword newprivpassword
```

ID = Host1\_323

Operation completed successfully.

## Delete SNMP destinations

Delete an SNMP destination.

**Note:** If you delete an SNMP destination, the system will stop sending alerts to it as traps.

## Format

```
/event/alert/snmp -id <value> delete
```

**Object qualifier**

| Qualifier | Description                                   |
|-----------|-----------------------------------------------|
| -id       | Type the ID of an SNMP destination to delete. |

**Example**

The following command deletes SNMP destination Host1\_323:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /event/alert/snmp -id
Host1_323 delete
```

Operation completed successfully.

# A

## Reference

This appendix addresses the following topics:

Storage resource size limitations ..... 230

## Storage resource size limitations

The following table lists the size restrictions when creating or resizing a storage resource with thin provisioning enabled or disabled, including the minimum, default, and maximum size for primary and protection storage, and the recommended size for schedule protection storage.

**Table 52 Storage resource size limitations**

| Storage resource type                    | Minimum size | Default size | Maximum size | Minimum protection size | Recommended size for scheduled protection | Maximum protection size |
|------------------------------------------|--------------|--------------|--------------|-------------------------|-------------------------------------------|-------------------------|
| Shared folders                           | 1 GB         | 100 GB       | 15.533 TB    | 0% or 5%                | 35%                                       | 16 TB                   |
| Generic iSCSI storage                    | 1 GB         | 100 GB       | 1.999 TB     | 0% or 105%              | 135%                                      | 14 TB                   |
| Generic iSCSI storage (TP <sup>a</sup> ) | 1 GB         | 100 GB       | 1.999 TB     | 0% or 105%              | 35%                                       | 14 TB                   |
| VMware VMFS datastores                   | 10 GB        | 100 GB       | 1.999 TB     | 0% or 105%              | 135%                                      | 14 TB                   |
| VMware VMFS datastores (TP)              | 10 GB        | 100 GB       | 1.999 TB     | 0% or 5%                | 35%                                       | 14 TB                   |
| VMware NFS datastores                    | 10 GB        | 100 GB       | 15.533 TB    | 0% or 5%                | 35%                                       | 16 TB                   |

a. Thin provisioning (TP) enabled.

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