

Unisphere CLI User Guide

Unisphere® Command Line Interface User Guide

5.x

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As part of an improvement effort, revisions of the software and hardware are periodically released. Therefore, some functions described in this document might not be supported by all versions of the software or hardware currently in use. The product release notes provide the most up-to-date information on product features. Contact your technical support professional if a product does not function properly or does not function as described in this document.

Where to get help

Support, product, and licensing information can be obtained as follows:

Product information

For product and feature documentation or release notes, go to Unity Technical Documentation at: www.emc.com/en-us/documentation/unity-family.htm.


Troubleshooting


For information about products, software updates, licensing, and service, go to Online Support (registration required) at: <https://Support.EMC.com>. After logging in, locate the appropriate **Support by Product** page.


Technical support


For technical support and service requests, go to Online Support at: <https://Support.EMC.com>. After logging in, locate **Create a service request**. To open a service request, you must have a valid support agreement. Contact your Sales Representative for details about obtaining a valid support agreement or to answer any questions about your account.


Special notice conventions used in this document

 **NOTE:** Indicates a hazardous situation which, if not avoided, will result in death or serious injury.

 **WARNING:** Indicates a hazardous situation which, if not avoided, could result in death or serious injury.

 **CAUTION:** Indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.

 **NOTE:** Addresses practices not related to personal injury.

 **NOTE:** Presents information that is important, but not hazard-related.

Introduction

This chapter contains the following topics:

Topics:

- [Overview](#)
- [Set up the Unisphere CLI client](#)
- [Unisphere CLI syntax](#)
- [Action commands](#)
- [Get help](#)
- [Manage SSL certificates](#)
- [View the switches](#)
- [Access the system](#)
- [Upload an upgrade candidate](#)
- [Hide header information](#)
- [Save Unisphere CLI settings](#)

Overview

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

Use the 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:

- File system storage, which contains one or more shares. Allows clients to store data and easily access file systems and shares that integrate seamlessly into:
 - Windows environments that use the SMB 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.
- LUN storage, over Fibre Channel (FC) or iSCSI protocol. You can have an individual LUN or a LUN group which can contains one or more LUNs. Provides block-level storage to hosts and applications that use the FC or iSCSI protocol to access storage in the form of LUNs.
- Storage for VMware virtual machines through NFS, VMFS, and Virtual Volume (VVOL) datastores.

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 LUN and delete the older snapshots created before it. Customer Support 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

About this task

To install the Unisphere CLI client:

Steps

1. Go to your 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:
 - 64-bit systems: C:\Program Files (x86)\Dell EMC\Unity\Unisphere CLI
 - 32-bit systems: C:\Program Files\Dell EMC\Unity\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

About this task

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:

Steps

1. If you have a Windows operating system, type:
uemcli.exe
2. If you have a UNIX/Linux operating system, type:
/usr/bin/uemcli

Certificate verification

In order to establish a secure connection between UEM CLI and its backend server, a Public Key infrastructure (PKI) is used. An important component of PKI, is certificate verification. Certificate verification provides a way for a user to verify the backend server being contacted.

When UEM CLI connects to a server requesting a secure connection, the server sends its identification in the form of a digital certificate. The certificate usually contains the following:

- Server name
- Trusted certificate authority (CA)
- Server's public encryption key.

The UEM CLI client may contact the server that issued the certificate (the trusted CA) and confirm the validity of the certificate before proceeding. When the certificate is verified, UEM CLI and its backend server will establish the connection and begin to exchange data.

Certificate verification level

The `setlevel.sh` script is used to set the certificate verification level to low or medium after the RPM package has been installed:

low	The certificate verification process will not be used to access the array.
medium (default)	The certificate verification process will be used to access the array.

Run the following command:

```
/opt/emc/uemcli/bin/setlevel.sh (low|medium|l|m)
```

Then follow the prompts. The tool will guide you through the steps to set the security level.

For more information, see the section [Manage SSL certificates](#) on page 25.

Unisphere CLI syntax

Following is the syntax of an example command line:

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

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 (-).

[View the switches](#) on page 27 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 file system. An object type can be a parent or a child of a parent. Not all parent object types contain child 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 23 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 19.

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 20 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)
```

The following table 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

Speed qualifiers

The following qualifiers are defined for the speed values. The qualifiers are case-insensitive.

Table 2. Speed qualifiers

Qualifier	Measurement
Kbps, Kb/s	1,000 bits per second
Mbps, Mb/s	1,000,000 bits per second
Gbps, Gb/s	1,000,000,000 bits per second
KBps, KB/s	1,000 bytes per second
MBps, MB/s	1,000,000 bytes per second
GBps, GB/s	1,000,000,000 bytes per second

Action commands

When using Unisphere CLI, there are four primary action commands that you can perform on object types or objects, including creating, changing/configuring, viewing, and deleting. This section explains each of these four action commands. [Unisphere CLI syntax](#) on page 18 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`:

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

```
Storage system address: 10.0.0.1  
Storage system port: 443  
HTTPS connection  
  
ID = local_user  
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. Some options for certain objects cannot be configured when creating the object, but can be configured after the object is creating using the set command. This guide often refers to those actions as **configure** actions. 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!
```

```
Storage system address: 10.0.0.1  
Storage system port: 443  
HTTPS connection  
  
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

```
uemcli [<switches>] <object> [<object qualifier>] show [{-detail | -brief | -filter  
<value>}] [-output {nvp | table [-wrap] | csv}]
```

Action qualifier

Qualifier	Description
<code>-output -o</code>	Specify the output format. Value is one of the following: <ul style="list-style-type: none"><code>nvp</code> — The name-value pair (NVP) format displays output as <code>name=value</code>. Name-value pair format on page 22 provides an example of the NVP format.

Qualifier	Description
	<ul style="list-style-type: none"> <code>table</code> — 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 <code>-wrap</code> after the table qualifier, separated by a space, so that the values wrap. Table format on page 22 provides an example of the table format. <code>csv</code> — 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 22 provides an example of the CSV format.
<code>-detail</code>	Display all attributes.
<code>-brief</code>	Display only the basic attributes (default).
<code>-filter</code>	Comma-separated list of attributes which are included into the command output.

Name-value pair format

```

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)

```

Table format

```

ID      | SP | Ports                | Health state
-----+---+-----+-----
la0_SPA | SPA | eth0_SPA,eth1_SPA | OK (5)
la0_SPB | SPB | eth0_SPB,eth1_SPB | OK (5)

```

Comma-separated values format

```

ID,SP,Ports,Health state
la0_SPA,SPA,"eth0_SPA,eth1_SPA",OK (5)
la0_SPB,SPB,"eth0_SPB,eth1_SPB",OK (5)

```

Example

The following command modifies the set of attributes in the show action output. For example, if you add `-filter "ID,ID,ID,ID"` to the command, in the output you will see four lines with the "ID" attribute for each listed instance:

```

1:  ID = la_0
    ID = la_0
    ID = la_0
    ID = la_0

```

```
uemcli /net/nas/server show -filter "ID, SP, Health state, ID, Name"
```

Filter format

```

Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

```

```

1:      ID          = nas_1
        SP          = SPA_
        Health state = OK (5)
        ID          = nas_1
        Name        = Mynas1

2:      ID          = nas_2
        SP          = SPA_
        Health state = OK (5)
        ID          = nas_2
        Name        = Mynas2

```

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 27 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 /dns` is the parent object type and `[config]` and `[domain]` are the child object types. 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 /dns` is the parent object type and `[config]` is the child object type. 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 -?
```

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

/net/if -id <value> set [ -vlanId <value> ] [ -addr <value> ] [ -netmask <value> ] [
-gateway <value> ]
Modify an existing interface.

Where:
-id <value>
Specify the ID of an interface (eg. if_0, if_3)

[Optional] -vlanId <value>
Specify the virtual LAN (VLAN) ID for the interface. The interface uses the ID to accept
packets that have VLAN tags. The value range is 1 to 4095. If the value is empty string,
VLAN tagging will be disabled.
[Optional] -addr <value>
Specify the IP address for the interface.

[Optional] -netmask <value>
Specify the subnet mask for the IPv6 interface.

[Optional] -gateway <value>
Specify the gateway for the interface.
```

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](#) 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
<code>-sslPolicy</code>	Value is one of the following: <ul style="list-style-type: none">• <code>interactive</code> — Client prompts the user to take action (default).• <code>reject</code> — Client automatically rejects the certificates.• <code>accept</code> — Client automatically accepts the certificates.• <code>store</code> — 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 21 explains how to change the output format.

Format

`-certList`


Delete certificates

Delete one or more SSL certificates from the lockbox.

Format

`-certDel <certificate IDs>`

Switch

Switch	Description
<code>-certDel</code>	Type a comma-separated list of certificate IDs to delete.  NOTE: Use <code>-certList</code> 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)

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|-?}]
```

The following table describes each of the switches:

Table 3. Switches

Switch	Description
-destination -d	IP (IPv4 or IPv6) 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.
-securePassword	Specifies the password in secure mode - the user will be prompted to input the password.
-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. Valid values are: <ul style="list-style-type: none">• interactive (default) — Prompt the user to accept the certificates for the current session.• reject — Automatically reject the certificates.• accept — Automatically accept the certificates.

Table 3. Switches (continued)


Switch	Description
	<ul style="list-style-type: none"> • <code>store</code> — Automatically accept and store the certificates.
<code>-certList</code>	List of all certificates stored locally in the lockbox.
<code>-certClear</code>	Delete all certificates stored locally in the lockbox.
<code>-certDel</code>	<p>Delete one or more certificates from the lockbox. Type a comma-separated list of certificate IDs.</p> <p> NOTE: Use <code>-certlist</code> to view a list of stored certificates with their IDs.</p>
<code>-certImport</code>	<p>Import a certificate from a file. Supported formats are:</p> <ul style="list-style-type: none"> • Privacy Enhanced Mail (PEM) • Distinguished Encoding Rules (DER) • Cryptographic Message Syntax (PKCS #7)
<code>-syntax -s</code>	<p>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: <code>-syntax uem:1.5</code></p>
<code>-upload</code>	<p>Upload a file to the system. Type the file type and location in the following format:</p> <pre>{-help <type> -help {-f -file} <file> <type> [<parameter>=<value>...]}</pre> <p>where:</p> <ul style="list-style-type: none"> • <code>-help</code> — Display a list of file types you can upload to the system. • <code>type -help</code> — Display information about a file type. Value is one of the following: <ul style="list-style-type: none"> ◦ <code>license</code> — A license file. During upload the license is installed on the system. ◦ <code>upgrade</code> — 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. ◦ <code>/net/nas/ldap</code> — A custom LDAP schema or a Certification Authority (CA) certificate for the NAS server identified by a mandatory <code>-server</code> parameter. Uploading a valid LDAP schema changes the LDAP configuration. This will result in changes to the file systems access on the specific NAS server. ◦ <code>/net/nas/server</code> — A custom user mapping rules file for the specific NAS server identified by a mandatory <code>-id</code> parameter. The mandatory <code>-type</code> parameter specifies the corresponding type of uploaded configuration file. Valid values are: <ul style="list-style-type: none"> ▪ <code>userMapping</code> ▪ <code>passwd</code> ▪ <code>group</code> ▪ <code>hosts</code> ▪ <code>netgroup</code> ▪ <code>homedir</code> ◦ <code>/net/nas/cava</code> — An antivirus configuration file with parameters of the CAVA service. ◦ <code>/net/nas/kerberos</code> — A Kerberos Key Table (keytab) file, which is required for secure NFS with a custom UNIX or Linux Kerberos KDC. It contains service principal names (SPNs), encryption methods, and keys for the secure NFS service. ◦ <code>/sys/cert</code> — A certificate file of a particular type for the specific service identified by mandatory <code>-type</code> and <code>-service</code> parameters. • <code>-f -file file type</code> — For file, type the path and filename of the file to upload. For type, type the file type to upload.

Table 3. Switches (continued)

Switch	Description
	<ul style="list-style-type: none"> parameter = value — Optional parameter=value pairs for including specific parameters during the upload. <p>NOTE: For a list of supported file types, type <code>-upload -help</code></p>
-download	<p>Download a file from the system. Type the file type and location in the following format:</p> <pre>{-help <type> -help {-d <folder> -f <file>}} <type> [-<parameter> <value> ...]}</pre> <p>where:</p> <ul style="list-style-type: none"> -help — Display a list of file types you can download from the system. type -help — Display information about a file type. Value is one of the following: <ul style="list-style-type: none"> serviceInfo — Download the service information file. If no ID is specified, the last service information file that was generated will be downloaded. Your service provider can use the collected information to analyze your system. This action should be executed with service user credentials. To download service information you should collect it at first using the <code>uemcli /service/system collect -serviceInfo</code> command. <p>NOTE: Contact your service provider to determine if it is necessary to collect this information and to establish a process for sending the file to customer support.</p> config — Save details about the configuration settings on the storage system to a file. Service personnel can use this file to assist you with reconfiguring your system after a major system failure or a system reinitialization. This action should be executed with service user credentials. The file only contains details about your system configuration. You cannot restore your system from this file. This action should be executed with service user credentials. <p>NOTE: It is recommended that you save the file to a remote location after every major system configuration change, to ensure that you always have a current copy of the file available.</p> /net/nas/ldap — A custom LDAP schema for the NAS server identified by a mandatory <code>-server</code> parameter. Once you configure LDAP settings for a NAS server, you can download the automatically generated LDAP schema file to make additional changes. /net/nas/server — A custom user mapping rules file for the specific NAS server identified by a mandatory <code>-id</code> parameter. The mandatory <code>-type</code> parameter specifies the corresponding type of uploaded configuration file. Valid values are: <ul style="list-style-type: none"> userMapping passwd group hosts netgroup homedir /net/nas/cava — A CAVA configuration file. /net/nas/kerberos — Kerberos Key Table (keytab) file, which is required for secure NFS with custom UNIX or Linux Kerberos KDC. It contains service principal names (SPNs), encryption methods, and keys for secure NFS service. /import/session/nas — A detailed file import status report that may contain error information for a VDM to NAS import session identified by the mandatory <code>-id</code> parameter.

Table 3. Switches (continued)

Switch	Description
	<ul style="list-style-type: none"> ○ <code>/sys/cert</code> — A certificate file present on the storage system identified by the mandatory <code>-id</code> parameter. ○ <code>encryption</code> — Three types of data at rest encryption (D@RE) files are available for downloading using the mandatory <code>-type</code> parameter. Valid values are: <ul style="list-style-type: none"> ■ <code>backupKeys</code> - When a copy of the keystore is requested, no additional parameters are required. It is recommended that a copy of the keystore be downloaded and saved whenever the provisioned or hardware configuration on the storage system changes. ■ <code>auditLog</code> - When a copy of the <code>auditlog</code> is requested, the mandatory <code>-entries</code> parameter must be supplied, where there are two options: <code>all</code> or <code>YYYY-MM</code>. All entries can be requested or a specific year and month of entries. The downloaded file has a maximum size of 100MB. If all the entries will not fit into this file size, the head of the storage system's <code>auditlog</code> will be returned. The remainder of the <code>auditlog</code> can be retrieved using the year and month option. <div> <i>NOTE:</i> When the <code>auditlog</code> is requested, its checksum file will be downloaded with it as well. </div> ■ <code>cksum</code> - Requests a regenerated checksum file for a previously downloaded <code>auditlog</code> file. In this case the mandatory <code>-logName <auditlog filename></code> parameter must be supplied. <div> <i>NOTE:</i> This must be the exact filename of a previously downloaded <code>auditlog</code> file. </div> ○ <code>/service/system/dump</code> — Core dump files are generated after an SP failure. Download these files to send to your service provider to help troubleshoot and resolve system issues. Service account credentials are required. ● <code>{-d <folder> -f <file>} <type></code> — Destination directory or path to the destination file. For <code><type></code>, enter the type of file to download. ● <code>[-<parameter> <value>...] [<action>]</code> — Download a file from the storage system. ● <code><type></code> — File type. ● <code>[-<parameter> <value> ...]</code> — Optional key-value pairs that are passed to the storage system via URL encoded parameters separated by spaces. ● <code> [<action>]</code> — Optional action indicating what shall be executed on the file downloaded.
<code>-gmtoff</code>	<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:</p> <p><code>[- +]<HH>[:<MM>]</code></p> <p>where:</p> <ul style="list-style-type: none"> ● <code>- +</code> — Type the sign of the GMT offset. If the offset is ahead of GMT, you can omit the plus sign. ● <code>HH</code> — Type the hours for the offset. ● <code>MM</code> — Type the minutes for the offset (optional). Separate the minutes from the hours with a colon.
<code>-help -h -?</code>	Display information about the syntax and switches.
<code>-saveUser</code>	Save the access credentials specified for the <code>-user</code> and <code>-password</code> 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.

Table 3. Switches (continued)

Switch	Description
	NOTE: Only one set of credentials for the system can be saved at a time. This means that if the Service password is different than the admin password, you cannot access the CLI with the service user account with <code>-saveUser</code> enabled.
<code>-removeUser</code>	Remove the specified user account from the lockbox.
<code>-default</code>	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. Unisphere CLI saves the specified destination and port pair to a local security file in the lockbox. Each time you include the <code>-default</code> switch, Unisphere CLI overwrites the previous saved destination and port pair with the current destination and port pair. If you include the <code>-port</code> switch, the specified port value is paired with the <code>-destination</code> value and saved to the local security file.
<code>-silent</code>	Allow a command to complete by suppressing the output and not requiring user confirmation. This is useful when there are commands in scripts.
<code>-noHeader</code>	Hide the header message (system IP address, port number, and so on) that appears above the command output.
<code>-v -version</code>	Display the version of your Unisphere CLI.
<code>-cmdTime</code>	Display the current time on the destination system.
<code>-enableStdErr</code>	Write error messages to <code>stderr</code> instead of <code>stdout</code> .
<code>-flatten</code>	Display all object names in a flattened format instead of tree format for help information.

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.



NOTE: 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. The `-saveUser` switch only supports one set of saved credentials for the system. This means that this switch should not be enabled if the admin and service passwords are different, as this will prevent successful log in of the service account into the CLI.

Format

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

Switches

Qualifier	Description
<code>-destination -d</code>	IP address or network name of the destination system. If you do not include this switch, the client uses the addresses specified for <code>-default</code> . If no default address exists, the client uses the localhost address 127.0.0.1.
<code>-user -u</code>	Domain and username for logging in to the system. For example, Local/joe.
<code>-password -p</code>	Password for logging in to the system.

Qualifier	Description
<code>-securePassword</code>	Specifies the password in secure mode - the user will be prompted to input the password.
<code>-port</code>	Specify the port number through which to access the system.  NOTE: If you do not include the <code>-port</code> switch, Unisphere CLI accesses the system through default port 443.
<code>-default</code>	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 <code>-default</code> switch, Unisphere CLI overwrites the previously saved destination and port pair with the current destination and port pair.  NOTE: If you include the <code>-port</code> switch, the specified port value is paired with the -destination value and saved to the local file. Hide header information explains saving user account credentials on the local client system.
<code>-saveUser</code>	Save the access credentials specified for the <code>-user</code> and <code>-password</code> 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 explains saving user account credentials on the local client system.
<code>-removeUser</code>	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 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 support website and use the `-upload` qualifier. Once you upload the candidate file to the system, use an upgrade session to start the upgrade process. [Create upgrade sessions](#) on page 44 explains configuring upgrade sessions.

Prerequisites

Download the latest system software upgrade candidate from the support website.

Format

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

Options

Qualifier	Description
<code>-f</code>	Type the path and file name 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-2.0.0.12190-MAGNUM-RETAIL.tgz.bin" upgrade
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection
```

```
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                   = EMC Storage Systems 12GB RAM WM PHTM
      Platform type          = EMC Storage System
      Product serial number  = FNM00102000154
      Auto fallback          = on
      Health state           = Degraded/Warning (10)
```

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. For more information, see the `-saveUser` switch in [View the switches](#) on page 27.
- SSL certificates imported from the system. For more information on SSL certificates, see [Manage SSL certificates](#) on page 25.
- Information about default system to access through Unisphere CLI, including the system name or IP address and the system port number. For more information, see the `-default` switch in [View the switches](#) on page 27.

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 XP: `C:\Documents and Settings\<account_name>\Local Settings\Application Data\.emc\uemcli`
- On Windows 7 and Windows 10: `C:\Users\${user_name}\AppData\Local\.emc\uemcli`
- On UNIX/Linux: `<home_directory>/.emc/uemcli`

The `cps.clb` and `csp.clb.FCD` files are lockbox-related. 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.

Manage the System

This chapter contains the following topics:

Topics:

- [Configure general system settings](#)
- [Configure system information](#)
- [Manage software versions](#)
- [View faulted storage resources](#)
- [Upgrade the system](#)
- [Manage security settings](#)
- [Manage system time](#)
- [Manage support configuration and proxy server settings](#)
- [Manage support contracts](#)
- [Manage Centralized ESRS](#)
- [Manage Integrated ESRS \(physical deployments only\)](#)
- [Manage Connect Home](#)
- [Manage user roles](#)
- [Manage user accounts](#)
- [Manage user account settings](#)
- [Manage support credentials](#)
- [Manage system limits](#)
- [View installed feature licenses](#)
- [View and accept the End User License Agreement](#)
- [Manage Unisphere Central Management/Monitoring](#)
- [Manage remote logging](#)
- [Manage system certificates](#)
- [Manage snapshot protection schedules](#)
- [Manage task rules](#)
- [Manage jobs](#)
- [Manage job step](#)

Configure general system settings

Configure general settings on the system, including:

- Enable or disable automatic failback for SP.
- Manually fail back NAS servers.
- Perform a check of the overall system health.
- Change the system name.

NOTE: Failover occurs when there is a hardware or software problem with an SP. This failover causes all NAS 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 failback is enabled, all NAS servers automatically fail back to their original SP.

The following table lists the general system attributes:

Table 4. General system attributes

Attributes	Description
System name	Name of the system.

Table 4. General system attributes (continued)

Attributes	Description
UUID base	Base value used to generate UUIDs in the host environment (such as OVMS hosts).
Model	System model.
System UUID (virtual deployments only)	System Universally Unique Identifier (UUID) for a virtual system.
License activation key (virtual deployments only)	A key that certifies that the system is licensed and the software was obtained legally.
Product serial number	System serial number.
Auto failback	Indication of whether auto failback is enabled for the SP. Valid values are: <ul style="list-style-type: none">• on• off
Health state	Health state of the system. The health state code appears in parentheses. Valid values are: <ul style="list-style-type: none">• Unknown (0) — Status is unknown.• OK (5) — 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.
Health details	Additional health information. See Appendix A, Reference, for health information details.
Power (Present) (physical deployments only)	Present system power consumption.
Power (Rolling Average) (physical deployments only)	Average system power consumption (in the past hour with 30-second sampling rate)

View system settings

View the current system settings.

 **NOTE:** The `show action command` on page 21 explains how to change the output format.

Format

```
/sys/general show
```

Example 1 (physical deployments only)

The following command displays the general settings for a physical system:


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

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

1:      System name           = demo
        UUID Base            = 0
        Model                 = Unity 300
        Platform type         = EMC Storage System
        System UUID           =
        Product serial number = demo
        Auto failback         = on
        Health state          = OK (5)
        Health details         = "The system is operating normally."
        Power (Present)        = 572 watts
        Power (Rolling Average) = 573 watts
        Supported SP upgrades  = SP400, SP500, SP600
```

Example 2 (virtual deployments only)

The following command displays the general settings for a virtual system:

 **NOTE:** The UUID Base does not display when the `-detail` option is not specified.

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

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

1:      System name           = Demo
        Model                 = UnityVSA
        System UUID           = 421D3F1B-6D79-52A1-9AC7-67AE794E520E
        License activation key = CQPZQ0DJJQHR0X
        Product serial number  = VIRT14349BPJEP
        Health state          = OK (5)
```

Change general system settings

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

Format

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

Action qualifiers

Qualifier	Description
<code>-name</code>	Type a name for the system.
<code>-uuidBase</code>	Type the UUID Base value.
<code>-autoFailback</code>	Enable or disable automatic failback. Valid values are: <ul style="list-style-type: none">on

Qualifier	Description
	<ul style="list-style-type: none"> off

Example

The following command disables automatic failback:

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

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

Operation completed successfully.
```

Manually fail back NAS servers

Manually fail back all failed over NAS servers to their original SP. If auto failback is enabled, failback occurs automatically.

Format

```
/sys/general failback
```

Example

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


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

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

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

The following command performs a health check of the system:

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

```
Storage system address: 10.0.0.1
Storage system port: 443
```

HTTPS connection

```
1: Error code = Error: The health check has failed. An internal error is preventing
the health check from completing successfully. Record the error code and search the
EMC Online Support website for available support options.
[Error Code: platform::check_boot_control_status_2]
```

Operation completed successfully.

NOTE:

- The results of the health check may show errors and warnings, but a message of `Operation completed successfully.` displays in the output. This is only an indication that the health check action was performed, not that it was successfully completed without errors and warnings. Attempt to resolve all errors and rerun the health check.
- If errors occur, a system software upgrade is not allowed. If warnings occur, they can be bypassed during the upgrade procedure.

Configure system information

Configure system information about the system's location and user.

The following table lists the system information attributes:

Table 5. System information attributes

Attribute	Description
Location name	Location name
Address 1	Contact address for the system
City	City name
State	State or province name
Country	Two-letter country code
Postal Code	Postal code
Contact first name	First name of the user.
Contact last name	Last name of the user.
Contact mobile phone	Mobile phone number of the user.
Contact company	Company of the user.
Site ID	Internal ID for identifying where the system is installed.
Contact email address	Contact email address for the system
Contact phone number	Contact phone number for the system

View system information

View current system information.

NOTE: The `show action command` on page 21 explains how to change the output format.

Format

```
/sys/info show
```

Example

The following command displays the general setting information for the system:

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

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

1:      Contact first name      = Zach
        Contact last name      = Arnold
        Contact company         = EMC
        Contact email address   = something@somemail.com
        Contact phone number    = 123456789
```

Configure or change the system contact information

Enter or change the system and contact information attributes.

Format

```
/sys/info set [-location <value>] [-contactFirstName <value>] [-contactLastName <value>] [-contactEmail <value>] [-contactPhone <value>] [-contactMobilePhone <value>]
```

Action qualifiers

Qualifier	Description
-location	Specify an updated location name.
-contactEmail	Specify the new contact email address for the system.
-contactPhone	Specify the new contact phone number for the system.
-contactMobilePhone	Specify the new contact mobile phone number for the system.
-contactFirstName	Specify the new contact first name for the system.
-contactLastName	Specify the new contact last name for the system.

Example

The following command changes the following system information:

- Contact first name
- Contact last name
- Contact email
- Contact phone
- System location
- Contact mobile phone

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /sys/info set -contactFirstName Zach -contactLastName Arnold -contactEmail something@someemail.com -contactPhone 1233456789 -location here -contactMobilePhone 987654321
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection
Operation completed successfully.
```


Manage software versions

See details about the system software versions that have been uploaded to the system manually by a user, or that have been automatically pushed down to the system by support.


 **NOTE:** Support will not push down any software images to the system without prior user consent.

Table 6. 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">installed — Software image that is currently installed on the systemcandidate — Upgrade candidate uploaded to the system for upgrading the system softwaredownloaded—Software image that was automatically pushed to the system by support.
Version	Software version.
Release date	Software release date.
Reboot required	Indication of whether a reboot is required for this software upgrade package. Values are: <ul style="list-style-type: none">yesno
Pause allowed	Indication of whether the software upgrade package allows the user to pause the upgrade and choose the desired disruptive upgrade window. Values are: <ul style="list-style-type: none">yesno
Image filename	Filename of the software image.

View system software versions

Display details about the version of the installed system software any upgrade candidates that have been uploaded to the system. [Upgrade the system](#) on page 44 explains how to upgrade the system software.

Format

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

Object qualifier

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">installed — View the version of the system software that is installed.candidate — View the version of the system software upgrade candidate that was uploaded to the system.downloaded — Software image that was automatically pushed to the system by support.

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
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection
```

```
1:   ID           = INST_1
    Type          = installed
    Version       = 4.3.0.1498853411
    Release date  = 2017-06-30 23:33:44
    Image type    =
    Reboot required =
    Pause allowed =
    Image filename =


2:   ID           = CAND_1
    Type          = candidate
    Version       = 4.3.0.1502142551
    Release date  = 2017-08-08 05:19:50
    Image type    = software
    Reboot required = yes
    Pause allowed = yes
    Image filename = Unity-c4dev_PIE_471-upgrade-4.3.0.1502142551-4.3.0.1502142551-
GNOSIS_DEBUG.tgz.bin

3:   ID           = ASD_1
    Type          = downloaded
    Version       = 4.2.0.9215195
    Release date  =
    Image type    = software
    Reboot required =
    Pause allowed =
    Image filename = Unity-_dev_001-
upgrade-4.2.0.9215195.9215195-4.2.0.9215195.9215195-GNOSIS_DEBUG.tgz.bin.gpg

4:   ID           = ASD_2
    Type          = downloaded
    Version       = V2-Dec-19-2016
    Release date  =
    Image type    = firmware
    Reboot required =
    Pause allowed =
    Image filename = Unity-Drive-Firmware-V2-Dec-19-2016.tgz.bin.gpg
```

Prepare system software version

Prepare an automatically downloaded software image for installation.

 **NOTE:** Support will not push down any software images to your system without prior user consent.

Format

```
/sys/soft/ver -id <value> prepare
```

Object qualifier

Qualifier	Description
-id	Type the ID of the automatically downloaded system software.

Example 1

The following command prepares automatically downloaded software image "ASD_1" for installation:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /sys/soft/ver -id ASD_1 prepare
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection


Operation completed successfully.
```

Example 2

The following command shows the error that is returned when trying to prepare an image that was not an automatically downloaded software candidate:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /sys/soft/ver -id CAND_1 prepare
```

```
Operation failed. Error code: 0x6000cd5
The specified image ID is invalid. The current action can only be performed on
downloaded images. Obtain the image ID with '/sys/soft/ver -type downloaded show' and
try again with correct image ID. (Error Code:0x6000cd5)
```

 **NOTE:** Use the `/sys/soft/ver show` command to obtain the ID of any automatically downloaded software images on the system. The "Type" should be "downloaded" such as in the following example:

```
ID                = ASD_1
Type              = downloaded
Version          = 4.2.0.9215195
Release date     =
Image type       = software
Reboot required  =
Pause allowed    =
Image filename   = Unity-_dev_001-
upgrade-4.2.0.9215195.9215195-4.2.0.9215195.9215195-GNOSIS_DEBUG.tgz.bin.gpg
```

View faulted storage resources

This command shows a list of which storage resources are in faulted states, including their health status details.

Format

```
/sys/res/health/fault
```

Example

The following example lists the storage resources that are in a faulted state, the type of resource, and the corresponding health state information.

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /sys/res/health/fault show
```

```
Storage system address: 10.64.75.201
Storage system port: 443
HTTPS connection

1:      ID                = pool_1
        Type              = pool
        Health state      = Degraded/Warning (10)
```

```
2:      ID          =      sv_2
      Type          =      lun
      Health state  =      Minor failure (15)
```

Upgrade the system

Create an upgrade session to upgrade the system 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 the support website. Use the `-upload` switch to upload it to the system before creating the upgrade session.

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. If any system components are degraded, the update will fail. [Perform a system health check](#) on page 38 explains how to run a health check on the system.

The following table lists the attributes for upgrade sessions.

Table 7. Upgrade session attributes

Attribute	Description
Status	Current status of the upgrade session. Value is one of the following: <ul style="list-style-type: none"> <code>running</code> — Session is upgrading the system software. <code>completed</code> — Session has completed upgrading the system software. <code>paused</code> — Upgrade session has paused before rebooting the SPs. <code>failed</code> — Upgrade session has failed.
Progress	Current progress of the upgrade session.
Creation time	Date and time the upgrade session was created.
Elapsed time	Amount of time that the upgrade session has been running.
Estimated time left	Estimated time required to complete the upgrade session.
Percent complete	Indicates the progress of the upgrade in percent.
Type	The type of upgrade being performed: software upgrade or storage processor upgrade. With software upgrade, details can be found with <code>/sys/soft/ver show</code> .
Additional info	Additional information about the status of the upgrade.

Create upgrade sessions

Creates a new upgrade session. This could be a software or hardware upgrade that is monitored by a session.



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

Format

```
/sys/upgrade create -type { software [-candId <value>] [-pauseBeforeReboot] | sp -
newSPModel <value>} [-offline]} [-pauseBetweenReboots]
```

Action qualifiers

Qualifier	Description
<code>-candId</code>	Type the ID of the uploaded upgrade candidate. View system software versions on page 41 explains how to view the ID of the uploaded software candidate.

Qualifier	Description
	 NOTE: This argument is optional. If unspecified, the system looks up the upgrade candidate.
-pauseBeforeReboot	Specify whether to pause during the upgrade, executing all tasks before the SPs reboot.  NOTE: This option is ignored for language packs, hot fix, and ODFU upgrades.
-newSPModel	Start a storage processor upgrade with the specified target model. The possible values for this system are identified using <code>/sys/general show</code> .
-offline	Optional parameter that will start an offline storage processor upgrade rather than an online (default) storage processor upgrade.
-pauseBetweenReboots	Optional parameter for software or online Data-in-place (DIP) upgrades. If specified, the system will pause after the first SP has been upgraded, but before the second SP is upgraded. This will allow you to suspend the upgrade until you manually resume the upgrade using <code>/sys/upgrade resume</code> .


Example 1

The following command creates a session to upgrade the system software:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /sys/upgrade create -type software
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

Operation completed successfully.
```

 **NOTE:** All warning messages, if any, appear the first time you run the upgrade process. When a potential issue results in a warning message, the upgrade process stops. Once you review the warning message, run the upgrade command again to continue with the upgrade process. This time the upgrade process will run the checks again, but it will not stop for any warnings. The upgrade process will only stop when an error occurs.

Example 2

The following command creates a session to upgrade the storage processor:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /sys/upgrade create -type sp -newSPModel SP500
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

Operation completed successfully.
```

Example 3

The following command initiates an offline DIP upgrade.

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /sys/upgrade create -type sp -newSPModel SP500 -offline
```

```
Storage system address: 10.64.75.201
Storage system port: 443
HTTPS connection

Operation completed successfully.
```

Example 4

The following command initiates a software upgrade that pauses after the first SP reboots.

```
uemcli /sys/upgrade create -type software -pauseBetweenReboots
```

```
Storage system address: 10.64.75.201
Storage system port: 443
HTTPS connection

Operation completed successfully.
```

View upgrade sessions

View details for an existing upgrade session.

 **NOTE:** The `show action command` on page 21 explains how to change the output format.

Format

```
/sys/upgrade show
```

Example 1

The following command displays details about the hardware upgrade session:

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

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

1:      Type           = SP
      Status          = Running
      Status message   =
      Creation time    = 2015-11-09 19:43:08
      Elapsed time     = 01h 3m 08s
      Estimated time left = 01h 70m 00s
      Progress        = Task 2 of 5 (Running health checks)
      Percent complete  = 5%
```

Example 2

The following command displays details about the software upgrade session:

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

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

1:      Type           = Software
      Status          = Failed
      Status message   = Stopping c4 stack on SPA timeout expired
      Creation time    = 2009-11-09 18:04:12
      Elapsed time     = 00h 20m 08s
      Estimated time left =
      Progress        = Task 5 of 25 (Stopping c4 stack on SPA)
      Percent complete  = 15%
```

Example 3

The following command shows an issue with the pre-upgrade health check in `Additional info`.

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

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

1:      Type           = Software
      Status          = Failed
      Creation time    = 2009-11-09 18:04:12
      Elapsed time     = 00h 20m 08s
      Estimated time left =
      Progress         =
      Percent complete = 5%
      Additional info  = "Error: The health check has failed. An internal
error is preventing the health check from completing successfully. Record the error
code and search the EMC Online Support website for available support options.
[Error Code: platform::check_boot_control_status_2]","Error: One or more LUNs are in
degraded state. Record the error code and contact your service provider. [Error Code:
flr::check_if_lun_recovery_is_required_2]"
```

Resume upgrade session

Resume an existing upgrade session that has been paused or has failed.

Format

```
/sys/upgrade resume
```

Example

The following command continues with the upgrade.

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

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection
```

```
Operation completed successfully.
```

Cancel upgrade session

Cancel an upgrade session that is failed or paused. If there is a failure with lock (later steps of OS upgrade or storage processor upgrade), the upgrade cannot be canceled and must be "resume" instead.

Format

```
/sys/upgrade cancel
```

Example

The following command cancels the upgrade session.

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

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection




Operation completed successfully.
```

Manage security settings

Manage system security settings.

The following table lists the system information attributes:

Table 8. Security settings attributes

Attributes	Description
FIPS 140 mode	Indicates whether the system is working in FIPS mode. Valid values are: <ul style="list-style-type: none">• enabled• disabled  NOTE: Default value is disabled.
TLS 1.0 mode	Indicates whether the system has TLS 1.0 enabled. Valid values are: <ul style="list-style-type: none">• enabled• disabled  NOTE: Default value is enabled.
Restricted shell mode	Indicates whether the storage processor has restricted shell enabled for the Service account. Valid values are: <ul style="list-style-type: none">• enabled• disabled  NOTE: Default value is enabled.

View security settings

Displays current system security settings.

Format

```
/sys/security show
```

Example

The following command displays the security settings for the system:

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

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

1: FIPS 140 mode           = enabled
   TLS 1.0 mode           = enabled
   Restricted shell mode   = enabled
```


Change security settings

Change the system security settings.

Format

```
/sys/security set {-fips140Enabled {yes | no} | -tls1Enabled {yes | no}} | -restrictedShellEnabled {yes | no}[-restrictedShellDisabledTimeout <value>]}
```

Action qualifiers

Qualifier	Description
-fips140Enabled	Enables or disables FIPS 140 compliance mode. Valid values are: <ul style="list-style-type: none">• yes• no
-tls1Enabled	Enables or disables TLS 1.0 protocol. Valid values are: <ul style="list-style-type: none">• yes• no
-restrictedShellEnabled	Enables or disables restricted shell on the storage processor for the Service account. Valid values are: <ul style="list-style-type: none">• yes• no

Examples

The following command changes the system security setting for FIPS 140 mode:

```
uemcli /sys/security set -fips140Enabled yes
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection
The system will reboot one SP at a time for this change to take effect. Do you want to
continue?
yes / no: yes

Operation completed successfully.
```

The following command changes the system security setting for TLS 1.0 protocol:

```
uemcli /sys/security set -tls1Enabled no
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection
Please refer to the security configuration guide for backward compatibility. You will
need to manually reboot both SPs for this change to take effect. Do you want to continue?
yes / no: yes

Operation completed successfully.
```

The following command changes the system security setting for restricted shell enabled setting:

```
uemcli /sys/security set -restrictedShellEnabled no
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection
This action will disable restricted shell for service account on the storage processor.
Do you want to continue?
```


```
yes / no: yes
```

```
Operation completed successfully.
```

Manage system time

The following table lists the system time attributes:

Table 9. System time attributes

Attributes	Description
Time	System time - not including the command processing delay. The difference between the requested time and the resulting time can be up to one minute due to the command processing delay.  NOTE: System time is affected by <code>-gmtoff</code> .

View system time

Display current system time.

Format

```
/sys/time show
```

Example

The following command displays the system time:

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

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection
```

```
1: Time      = 2011-01-01 03:00:00
```

Change system time




Change the system time.

Format

```
/sys/time set {-clientTime | -utc <value>} [-force {noreboot | allowreboot | allowdu}]
```

Action qualifiers

Qualifier	Description
-clientTime	Indicates that the system time should be synchronized with the time on the system from which the CLI is being run.

Qualifier	Description
	 NOTE: The difference between the client time and the resulting system time can be up to one minute as a result of the command processing delay.
-utc	Specify time to set on the system (in UTC format). Format: <YYYY>-<MM>-<DD><hh>:<mm>:<ss>  NOTE: The difference between the requested time and the resulting time can be up to one minute due to the command processing delay.
-force	Specify whether to accept or decline the system reboot, which may be needed to complete the time change. If the qualifier is not specified, you will be asked to confirm the reboot if it's needed. Valid values are: <ul style="list-style-type: none"> • noreboot • allowreboot • allowdu  NOTE: allowdu is used if the system is in a degraded state or has one SP (data will be unavailable during its reboot). Otherwise allowreboot is used. In silent mode, system will be rebooted if needed.

Example

The following command accepts the system reboot:

```
uemcli /sys/time set -utc "2011-05-17 14:26:20" -force allowreboot
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection
```

```
Operation completed successfully
```

Manage support configuration and proxy server settings

Manage support configuration settings on the system, including:

- Name of IP address of proxy server.
- Port number of the proxy server.
- Name of the account on the proxy server.
- Password of the account.
- Whether the support contracts list is updated automatically on a weekly basis.
- Whether cloud management is enabled for services like Cloud IQ.

The following table lists the support configuration attributes:

Table 10. Support configuration attributes

Attributes	Description
Support proxy server address	Name or IP address of the support services proxy server.
Support proxy server port	Port number of the support services proxy server
Support proxy server user name	Name of the account on the support proxy server.
Support proxy server password	Password of the account on the support proxy server.
Automatic support contracts update enabled	Indicates whether the system automatically updates its service contracts list once a week.
Cloud management enabled	Indicates whether cloud management is enabled. Values are: <ul style="list-style-type: none"> • enabled

Table 10. Support configuration attributes (continued)

Attributes	Description
	• disabled (default)

View support configuration and proxy server settings

View the current support configuration information.

Format

```
/sys/support/config show
```

Example 1

The following command displays the support configuration:

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

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

1:      Support proxy server enabled = yes
        Support proxy server address = 10.0.0.1
        Support proxy server port    = 1080
```

Example 2

The following command displays the support configuration:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /sys/support/config show -detail
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

1:      Support proxy server enabled           = no
        Support proxy server address          =
        Support proxy server port              = 0
        Support proxy user name                =
        Support proxy protocol                 = Unknown
        Automatic support contracts update enabled = no
        Cloud management enabled              = no
```




Configure or change support and proxy server settings

Change support configuration attributes.

Format

```
/sys/support/config set [-enableSupportProxy {yes | no }] [-supportProxyAddr <value>]
[-supportProxyPort <value>] [-supportProxyUser <value> {-supportProxyPasswd <value> |-
supportProxyPasswdSecure}] [-supportProxyProtocol {http | socks}] [-autoUpdateContracts
{yes | no}] [-enableCloudMgmt {yes | no}]
```

Action qualifiers

Qualifier	Description
-enableSupportProxy	Specifies whether to enable or disable the proxy server. Valid values are: <ul style="list-style-type: none">• yes• no
-supportProxyAddr	Specify the name or IP address of the support services proxy server.
-supportProxyPort	Specify the port of the support services proxy server.
-supportProxyUser	Specify the user name of an account on the support services proxy server.
-supportProxyPasswd	Specify the password for the support services proxy server account.
-supportProxyPasswdSecure	Specifies the password in secure mode - the user is prompted to input the password.
-supportProxyProtocol	Specify the protocol used for communications with the support proxy server. Valid values are: <ul style="list-style-type: none">• http• socks  NOTE: Values are case-sensitive.
-autoUpdateContracts	Specify whether the system automatically updates its service contracts list once a week. Valid values are: <ul style="list-style-type: none">• yes• no  NOTE: Values are case-sensitive.
-enableCloudMgmt	Specify whether sending data to CloudIQ is enabled on the system. Valid values are: <ul style="list-style-type: none">• yes• no  NOTE: Values are case-sensitive.

Example

The following command specifies the support services proxy server parameters:

```
uemcli /sys/support/config set -supportProxyAddr 10.0.0.1 -supportProxyPort 8080 -supportProxyUser user1 -supportProxyPasswd password123 -supportProxyProtocol http
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

Operation completed successfully.
```

Manage support contracts

Manage support contracts on the system.

The following table lists the support contracts attributes:

Table 11. Support contracts attributes

Attributes	Description
ID	Support contract identifier.

Table 11. Support contracts attributes (continued)

Attributes	Description
Status	State of the support contract. Value is one of the following: <ul style="list-style-type: none">• active• about to expire• expired
Service type	Type of the support contract.
Start date	Start date of the support contract.
Expiration date	Expiration date of the support contract

View support contracts

View the available support contracts.

Format

```
/sys/support/contract [-id <value>] show
```

Action qualifiers

Qualifier	Description
-id	Identifies the support contracts

Example

The following command displays the support contracts:

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

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

1: ID           = contract1
   Status       = active
   Service type = software
   Expiration date = 2012/12/31
```

Refresh support contracts

Refresh or update the list of support contracts from a support server.

Format

```
/sys/support/contract refresh
```

Example

The following command displays the support contracts:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /sys/support/contract refresh
```


```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

Operation completed successfully.
```

Manage Centralized ESRS

Centralized ESRS runs on a gateway server. When you select this option, your storage system is added to other storage systems in an ESRS cluster. The cluster resides behind a single common (centralized) secure connection between EMC servers and an off-array ESRS Gateway. The ESRS Gateway is the single point of entry and exit for all IP-based ESRS activities for the storage systems associated with the gateway.

The ESRS Gateway is a remote support solution application that is installed on one or more customer-supplied dedicated servers. The ESRS Gateway functions as a communication broker between the associated storage systems, Policy Manager and proxy servers (optional), and the EMC enterprise. Connections to the Policy Manager and associated proxy servers are configured through the ESRS Gateway interface along with add (register), modify, delete (unregister), and querying status capabilities that ESRS clients can use to register with the ESRS Gateway.

 **NOTE:** To use Centralized ESRS, valid support credentials must be set.

The following table lists the attributes for Centralized ESRS:

Table 12. Centralized ESRS attributes

Attributes	Description
Enabled	Indicates whether the Centralized ESRS service is enabled. Valid values are: <ul style="list-style-type: none">• yes• no
Address	Indicates the IP address of the Centralized ESRS server.
Port	Indicates the port number of the Centralized ESRS server.
Secondary Address	Indicates the IP address of the secondary Centralized ESRS server.
Secondary Port	Indicates the port number of the secondary Centralized ESRS server.

View Centralized ESRS configuration

View details about the Centralized ESRS configuration.

Format

```
/sys/support/esrsc show
```

Example

The following command displays the Centralized ESRS configuration:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /sys/support/esrsc show -detail
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection
```

```
1:      Enabled          = yes
      Address           = 10.10.10.123
      Port              = 9443
      Secondary Address = 10.10.10.124
      Secondary Port    = 9443
```



Enable or change Centralized ESRS

Enable or change the Centralized ESRS configuration.

Format

```
/sys/support/esrsc set -enable { yes | no } [ -address <value> ] [ -port <value> ] [-secondAddress <value>] [-secondPort <value>]
```

Action qualifiers

Qualifier	Description
-enable	Specifies whether to enable or disable Centralized ESRS. Valid values are: <ul style="list-style-type: none">• yes• no  NOTE: If ESRS is disabled, other parameters cannot be changed.
-address	Specifies the IP address of the Centralized ESRS VE server to which to be connected.
-port	Specifies the port number to be used to connect to the centralized ESRS.
-secondAddress	Specify the network name or IP address of the secondary Centralized ESRS VE server.
-secondPort	Specify the port number to be used to connect to the primary Centralized ESRS VE server.  NOTE: The secondary gateway should be in the same cluster as the primary gateway.

Example 1

The following command specifies the Centralized ESRS parameters:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /sys/support/esrsc set -enable yes -address 10.10.22.22
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

Operation completed successfully.
```

Example 2

The following example configures Centralized ESRS VE with a secondary gateway for high availability.

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /sys/support/esrsc set -enable yes -address 10.10.22.22 -secondAddress 10.10.22.32
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection
```


Operation completed successfully.

Check Centralized ESRS network connection

Check Centralized ESRS network connectivity before configuring ESRS.

Check the network connectivity from Centralized ESRS to the Dell EMC servers. If there is any failure, Centralized ESRS cannot be enabled.

Format

```
/sys/support/esrsc checkNetwork -address <value> [-port <value>]
```

Action qualifier

Qualifier	Description
-address	Type the IP address of Centralized ESRS VE.
-port	Type the port number used for Centralized ESRS VE.

Example

This example shows when the network connectivity check for Centralized ESRS fails.

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /sys/support/esrsc checkNetwork -address 10.100.10.7
```

```
Storage system address: 10.0.0.1  
Storage system port: 443  
HTTPS connection
```

```
Operation failed. Error code: 0x6400be8
```

```
The centralized ESRS network connectivity check failed. Please check your firewall  
configuration and whether the centralized ESRS server is operating normally. (Error  
Code:0x6400be8)
```

Test Centralized ESRS

Once Centralized ESRS is already configured, you can use this command to test the connection between your system and the ESRS database. While the `checkNetwork` command will check your local network connectivity, this `test` command will check the connection back to Dell EMC.

Format

```
/sys/support/esrsc test
```

Example 1

The following example shows the results of running this command when Centralized ESRS is not yet configured.

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /sys/support/esrsc test
```

```
Operation failed. Error code: 0x6400c06  
Not supported since Centralized Secure Remote Support is not enabled. (Error  
Code:0x6400c06)
```

Example 2

The following example shows when this command is run successfully.

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /sys/support/esrsc test
```

```
Storage system address: 10.0.0.1  
Storage system port: 443  
HTTPS connection
```

```
Operation completed successfully.
```

NOTE: A successful operation indicates that the test was executed successfully, not that the connection itself was successful. In other words, it indicates a Call Home was sent, but does not indicate whether it was received by the ESRS server. To check the status of the actual test, log into Service 360 to view recent Service Requests (SRs). If the call home was received by the ESRS server, the connection test will appear as an automatically-closed Call Home SR.

Manage Integrated ESRS (physical deployments only)

NOTE: This feature may not be available in your implementation.

Integrated ESRS runs directly on your storage system. When you configure this option, your storage system sets up a secure connection between itself and the Support Center. You can select one of the following remote service connectivity options for Integrated ESRS:

- Outbound/Inbound, which is the default, from the storage system to the Support Center and from the Support Center to the storage system for remote access using https.
- Outbound only from the storage system to the Support Center using https.

When you select the Outbound/Inbound option, the storage system sets up a secure connection between itself and the Support Center. This option enables remote service connectivity for dial out and dial in capabilities with the storage system. The connection from the storage system to a Policy Manager and any associated proxy servers (optional) must be configured through either Unisphere or the CLI.

When you select the Outbound only option, the storage system sets up a secure connection between itself and the Support Center. This option enables remote service connectivity for dial out only capabilities with the storage system.

NOTE: To use Integrated ESRS, valid support credentials must be set. Integrated ESRS is required to be enabled before you can configure a policy manager and any associated proxy servers.

The following table lists the attributes for Integrated ESRS:

Table 13. Integrated ESRS attributes

Attribute	Description
Enabled	Indicates whether the Integrated ESRS service is enabled. Valid values are: <ul style="list-style-type: none">• yes• no
EULA accepted	Indicates whether the ESRS end user license agreement EULA has been accepted. Valid values are: <ul style="list-style-type: none">• yes
Site ID	Indicates the assigned ID number for the location within your organization where the system is located.

Table 13. Integrated ESRS attributes (continued)

Attribute	Description
Type	Specifies the Integrated ESRS type. Valid values are: <ul style="list-style-type: none">• oneWay• twoWay

View Integrated ESRS configuration

View details about the Integrated ESRS configuration.

Format

```
/sys/support/esrsi show
```

Example

The following command displays the Integrated ESRS configuration:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /sys/support/esrsi show -detail
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection
```

```
1:      Enabled      = yes
      EULA accepted = yes
      Type           = Two way
```



Enable or change Integrated ESRS

Enable or change the Integrated ESRS configuration.

Format

```
/sys/support/esrsi set {-enable {yes|no}}{-acceptEula yes|-type {oneWay|twoWay}}
```

Action qualifiers

Qualifier	Description
-enable	Specifies whether to enable or re-enable, or disable the ESRS. Valid values are: <ul style="list-style-type: none">• yes• no  NOTE: If ESRS is disabled, other parameters cannot be changed.
-acceptEula	Specifies whether to accept the end user license. Valid value is: <ul style="list-style-type: none">• yes  NOTE: If ESRS EULA is not accepted, nothing can be configured for the Integrated ESRS.
-type	Specifies which type of Integrated ESRS to use. Valid values are: <ul style="list-style-type: none">• oneWay (Outbound only)• twoWay (Outbound/Inbound) (default)

Example

The following command enables Integrated ESRS, accepts the EULA, and sets the type of Integrated ESRS:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /sys/support/esrsi set -enable yes -acceptEula yes -type oneWay
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

Operation completed successfully.
```

Check Integrated ESRS network connection

Check the network connectivity from the Integrated ESRS client to the EMC servers. If there is any failure, the Integrated ESRS cannot be enabled.

Format

```
/sys/support/esrsi checkNetwork
```

Example

The following command displays the network connectivity for Integrated ESRS:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /sys/support/esrsi checkNetwork
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

Operation failed. Error code: 0x6400bc8
Remote Support cannot be enabled at this time, because the system cannot contact some
required EMC servers: esrghoprd02.emc.com:443/8443,esrghoprd03.emc.com:8443/443. Please
refer to online help for this error code to resolve the issue. (Error Code:0x6400bc8)
```

Check support credential readiness for integrated ESRS

Before configuring ESRS, check that the support account credentials configured for your system are properly registered in the Online Support database.

Format

```
/sys/support/esrsi checkSupportAccountReadiness
```

Example

The following example shows that the command run successfully, where support credentials are properly configured.

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /sys/support/esrsi checkSupportAccountReadiness
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

Operation completed successfully.
```

Test Integrated ESRS

Once Integrated ESRS is already configured, you can use this command to test the connection between your system and the ESRS database. While the `checkNetwork` command will check your local network connectivity, this `test` command will check the connection back to Dell EMC.

Format

```
/sys/support/esrsi test
```

Example 1

The following example shows the results of running this command when Integrated ESRS is not yet configured.

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /sys/support/esrsi test
```

```
Operation failed. Error code: 0x6400bad
  Not supported since Integrated Secure Remote Support is not enabled. (Error
  Code:0x6400bad)
```

Example 2

The following example shows when this command can be executed successfully.

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /sys/support/esrsi test
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

Operation completed successfully.
```

NOTE: A successful operation indicates that the test was executed successfully, not that the connection itself was successful. In other words, it indicates a Call Home was sent, but does not indicate whether it was received by the ESRS server. To check the status of the actual test, log into Service 360 to view recent Service Requests (SRs). If the call home was received by the ESRS server, the connection test will appear as an automatically-closed Call Home SR.

Request access code for Integrated ESRS

Request an access code for Integrated ESRS. This access code will be emailed to the email account user. The access code will only be valid for 30 minutes. This process adds an extra level of authentication and helps to ensure that you are the correct user and authorized to enable ESRS on the storage system.

Format

```
/sys/support/esrsi requestAccessCode
```

Example

The following command sends a request for an access code as part of the email verification process for Integrated ESRS:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /sys/support/esrsi requestAccessCode
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection
```

```
1:      Recipient email address = sxxxxxxx@mail.com
```

Validate access code for Integrated ESRS

Validate the access code for Integrated ESRS that was received by email to the email account user. The received access code will only be valid for 30 minutes.

Format

```
/sys/support/esrsi validateAccessCode -accessCode <value>
```

Example

The following command displays the response to validating the access code part of the email verification process:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /sys/support/esrsi validateAccessCode -accessCode 76507252
```


```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

Operation completed successfully.
```

Manage Policy Manager

The Policy Manager is optional and is installed on a customer supplied server or servers. It enables customizable control of remote access to customer devices and maintains an audit log of remote connections. When the ESRS server retrieves a remote access from the EMC Enterprise, the access is controlled by the policies configured on the Policy Manager and are enforced by the ESRS server.

A proxy server can be configured for the server on which the Policy Manager is installed to connect to the Internet. The proxy server configured for the Policy Manager is called a Policy Manager Proxy.

 **NOTE:** Integrated ESRS is required to be enabled before you can configure a Policy Manager and any associated proxy servers.

The following table lists the attributes for a Policy Manager and proxy server:

Table 14. Policy Manager and proxy server attributes

Attribute	Description
Enabled	Indicates whether the policy manager is enabled or not. Valid values are: <ul style="list-style-type: none">• yes• no
Address	Policy manager name or IP address
Port	Policy manager port number
Protocol	Protocol used for communication with the policy manager. Valid values are: <ul style="list-style-type: none">• http• https (default)
SSL strength	The ESRS Policy Manager SSL strength (applicable only when protocol is HTTPS). Valid values are: <ul style="list-style-type: none">• high (default)

Table 14. Policy Manager and proxy server attributes (continued)

Attribute	Description
	<ul style="list-style-type: none">• medium• low
Proxy enabled	Indicates whether the policy manager proxy is enabled or not. Valid values are: <ul style="list-style-type: none">• yes• no
Proxy address	Name or IP address of the proxy server used by the policy manager
Proxy port	Port of the proxy server used by the policy manager
Proxy username	Name of the account on the policy proxy server
Proxy password	Password of the account on the policy proxy server
Proxy protocol	Protocol used for communications with the policy proxy server. Valid values are: <ul style="list-style-type: none">• http• socks (default)

View Policy Manager and proxy server configuration

View details about the Policy Manager and proxy server configuration.

Format

```
/sys/support/esrsi/policymgr show
```

Example

The following command displays the configuration of the Integrated ESRS policy manager server:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /sys/support/esrsi/policymgr show -detail
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection
```

```
1:      Enabled          = no
        Address          =
        Port              = 0
        Protocol          =
        SSL strength      =
        Proxy enabled     = no
        Proxy address     =
        Proxy port        = 0
        Proxy user name   =
        Proxy protocol    =
```



Configure or change Policy Manager and proxy server settings

Configure or change the Policy Manager and proxy server attributes.

Format

```
/sys/support/esrsi/policymgr set [ -enable { yes | no } ] [ -address <value> ] [ -port <value> ] [ -protocol { http | https } ] [ sslStrength { high | medium | low } ] [ -enableProxy { yes | no } ] [ -proxyAddr <value> ] [ -proxyPort <value> ] [ -proxyUser <value> { -proxyPasswd <value> | -proxyPasswdSecure } ] [ -proxyProtocol { http | socks } ]
```

Action qualifiers

Qualifier	Description
-enable	Specifies whether to enable or disable the ESRS policy manager. Valid values are: <ul style="list-style-type: none">• yes• no  NOTE: If the ESRS policy Manager is disabled, other policy manager parameters cannot be changed.
-address	Specifies the policy manager address to be configured for Integrated ESRS.
-port	Specifies the policy manager server port number to be configured for Integrated ESRS.
-protocol	Specifies the protocol to be used by the policy manager server.
-sslStrength	Specifies the ESRS Policy Manager SSL strength (applicable only when the protocol is HTTPS). Valid values are: <ul style="list-style-type: none">• high• medium• low
-enableProxy	Specifies to enable the policy manager proxy. Valid values are: <ul style="list-style-type: none">• yes• no  NOTE: If the ESRS Policy Manager is disabled, other policy manager proxy server parameters cannot be changed.
-proxyAddr	Specifies the policy proxy server address.
-proxyPort	Specifies the policy proxy port number.
-proxyUser	Specifies the user name of the account on the policy manager proxy server.
-proxyPasswd	Specifies the password of the account on the policy manager proxy server.
-proxyProtocol	Specifies the protocol to be used by the policy manager proxy server.

Example

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /sys/support/esrsi/policymgr set -enable no
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

Operation completed successfully.
```

Manage Connect Home

Configure Connect Home to send system information directly to support when critical alerts occur.

Connect Home uses SMTP (Simple Mail Transport Protocol) to automatically email system information directly to support. These emails contain system event and error histories that can be used by support for diagnosing and troubleshooting issues.

Table 15. Connect Home attributes

Attribute	Description
Enabled	Indicates whether Connect Home is enabled. Valid values are: <ul style="list-style-type: none">• yes• no
SMTP server	The IP address of the SMTP server configured for Connect Home.
E-mail from address	The email address from which Connect Home emails are sent to support.
E-mail to address	The destination email address to which Connect Home emails are sent.

View Connect Home

This command shows the Connect Home configuration settings.

View the current Connect Home configuration settings.

Format

```
/sys/support/connecthome show
```

Example

The following command shows the configuration details for Connect Home.

```
uemcli -d 10.0.0.1 -u admin -p Password /sys/support/connecthome show -detail
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

1:      Enabled           = yes
        SMTP server       = 10.10.10.123
        E-mail from address = bs-xxxx@emc.com
        E-mail to address  = emailalertesg@emc.com
```

Change the Connect Home configuration settings

This command changes the configuration settings for Connect Home.

Change the configuration settings for Connect Home.

Format

```
/sys/support/connecthome set [-enable {yes | no}] [ -smtpServer <value>] [-emailFromAddr <value>]
```

Action qualifiers

Qualifier	Description
-enable	Specify whether to enable Connect Home. Valid values are: <ul style="list-style-type: none">• yes

Qualifier	Description
	<ul style="list-style-type: none"> no
-smtpServer	Specify the IP address of the SMTP server that Connect Home will use to send emails.
-emailFromAddr	Specify the email address from which Connect Home emails will be sent to support. If not specified, a default value formatted as <arrayname>@emc.com will be used.

Example

This example enables Connect Home and specifies that it will use SMTP server 10.10.22.22.

```
uemcli -d 10.0.0.1 -u local/joe -p Password /sys/support/connecthome set -enable yes -smtpServer 10.10.22.22
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

Operation completed successfully.
```

Test Connect Home

This command tests a successful Connect Home email alert transmission.

Test whether Connect Home can successfully send an email alert to support using the specified SMTP server.

Format

```
/sys/support/connecthome test
```

Example

This example shows the results of a test email alert using the specified Connect Home configuration settings.

```
uemcli -d 10.0.0.1 -u local/joe -p Password /sys/support/connecthome test
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

Operation completed successfully.
```

Manage user roles

View the supported roles of users on the system, as well as the types of actions each type of user can perform.

The following table lists the attributes for user roles:

Table 16. User role attributes

Attributes	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 and edit settings. Cannot add user

Table 16. User role attributes (continued)

Attributes	Description
	accounts or host configurations, perform initial system configuration, modify network settings, create or delete NAS servers, or upgrade system software. <ul style="list-style-type: none">• <code>operator</code> — Operator role: Can view system and storage status information but cannot change system settings. This role provides view-only permissions.• <code>securityadministrator</code>— Security administrator role: Can view system and storage status information but perform only security related tasks. Cannot perform any operations.• <code>vmadmin</code>— VMware administrator role: Used only for adding the system as a VASA provider in vCenter.
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.

Format

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

Object qualifier

Qualifier	Description
<code>-name</code>	Type the name of the user role. Value is one of the following: <ul style="list-style-type: none">• <code>administrator</code> — Administrator role• <code>storageadmin</code> — Storage Administrator role• <code>operator</code> — Operator role (view only)• <code>securityadministrator</code> — Security Administrator role• <code>vmadmin</code>— VMware Administrator (used only to register the system as a VASA provider in vCenter)

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 -detail
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection
```

```
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.
```

```
4:      Name      = securityadministrator
```

```
Description = User is allowed only to perform security tasks and is able to see
all storage system data, but cannot perform any operations.

5:      Name      = vmadmin
      Description = Can only be used to establish a VASA connection from vCenter to the
storage system.
```

Manage user accounts

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. When users connect to the system through the CLI or Unisphere UI, the system prompts them to type their username and password to gain access.

Table 17. User account attributes

Attributes	Description
ID	Identifier of the specific user account.
Name	Account name.
Role	The role type of the user account.
Type	The account type (scope). Values are: <ul style="list-style-type: none">• local• ldapuser• ldapgroup
Password	Local account password.
Password expiration status	Information about when the account password will expire. Values are: <ul style="list-style-type: none">• <value> days remaining• Expired• An empty value, which means the password does not expire for that specific user account. For example, user accounts with the account type of ldapuser or ldapgroup.

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> | -passwdSecure} |
ldapuser | ldapgroup} -role <value>
```

Action qualifiers

Qualifier	Description
-name	Type a name for the account. For LDAP users and groups, specify only the username, do not include the domain name.  NOTE: The LDAP user or group name is case sensitive; that is, use the same case as the LDAP user or group that is specified in the LDAP server.

Qualifier	Description
-type	Type the type of user or user group. Value is one of the following: <ul style="list-style-type: none"> local — Local user. ldapuser — User has an LDAP account. ldapgroup — Group has an LDAP account.
-passwd	For local users, type the user password. The following are the password requirements for user accounts: <ul style="list-style-type: none"> Passwords must be 8 to 40 characters in length and cannot contain spaces. Passwords must include mixed case, a number, and a special character from this list: ! , @ # \$ % ^ * ? _ ~ When changing a password, do not reuse any of the last 3 passwords.
-passwdSecure	Specifies the password in secure mode - the user will be prompted to input the password and the password confirmation.
-role	Type the name of the role for the account. Value is one of the following: <ul style="list-style-type: none"> administrator — Administrator storageadmin — Storage Administrator operator — Operator (view only) securityadministrator — Security Administrator vmadmin— VMware Administrator The /user/role show -detail command returns a list of all available user roles. User role attributes on page 66 provides a detailed description of each user role.

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
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

ID = user_user1
Operation completed successfully.
```

View user accounts

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

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
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

1:      ID    = user_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> | -passwdSecure} { {-oldpasswd <value> |
-oldpasswdSecure} | -force}] [ -role <value>] [-locked {yes | no}]
```

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. The following are the password requirements for user accounts: <ul style="list-style-type: none">• Passwords must be 8 to 40 characters in length and cannot contain spaces.• Passwords must include mixed case, a number, and a special character from this list: ! , @ # \$ % ^ * ? _ ~• When changing a password, do not reuse any of the last 3 passwords.
-passwdSecure	Specifies the password in secure mode. The user will be prompted to input the password and the password confirmation.
-oldpasswd	Type the old password to set the new password.
-oldpasswdSecure	Specifies the password in secure mode. The user will be prompted to input the password.
-force	Reset the password.  NOTE: You must be an administrator to use this qualifier.
-role	Type the name of the role for the account. Value is one of the following: <ul style="list-style-type: none">• administrator — Administrator• storageadmin — Storage Administrator• operator — Operator (view only)

Qualifier	Description
	<ul style="list-style-type: none"> securityadministrator — Security Administrator vmadmin— VMware Administrator <p>The <code>/user/role show -detail</code> command returns a list of all available user roles. User role attributes on page 66 provides a description of each user role.</p>
-locked	<p>Specifies whether to lock or unlock the user account. Valid values are:</p> <ul style="list-style-type: none"> yes--locks the user account. no--unlocks the user account. <p> NOTE: This option can only be set by users who have either the administrator or security administrator role, and only on STIG-enabled systems.</p>

Example

The following command changes the password for user account user_user1:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /user/account -id user_user1 set -passwd NewPassword456! -oldpasswd OldPassword456!
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

ID = user_user1
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 user_user1:

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

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

Operation completed successfully
```

Manage user account settings

Manage the detailed account settings for users on the system.


 **NOTE:** This command is available only for STIG-enabled systems.

Table 18. User account settings attributes




Attributes	Description
Enabled	<p>Indicates whether or not the user account settings feature is enabled. Values are:</p> <ul style="list-style-type: none">• yes• no <p> NOTE: When this value is yes, but the detailed account settings are not specified, the "Default enabled value" for each setting, as specified below, is used.</p> <p>When this value is no, the "Disabled value" for each setting is used.</p>
Password minimum size	<p>Minimum number of characters for a password. Value range is 8–40. Default values are:</p> <ul style="list-style-type: none">• Default enabled value: 15• Disabled value: 8
Number of previous passwords	<p>Indicates the number of past passwords that cannot be reused until the cycle has reset. Value range is 3–12. Default values are:</p> <ul style="list-style-type: none">• Default enabled value: 5• Disabled value: 3
Password period	<p>The time period (in days) a password is valid for before it expires. Value range is 1–180 days. An empty value indicates the password does not expire. Default values are:</p> <ul style="list-style-type: none">• Default enabled value: 60• Disabled value: no expiration (empty)
Maximum failed logins	<p>The number of consecutive failed login attempts allowed within the failed login period before the account is locked. An empty value indicates that there is no limit. Value range is 1–10. Default values are:</p> <ul style="list-style-type: none">• Default enabled value: 3• Disabled value: no limit (empty) <p> NOTE: Maximum failed logins, Failed login period, and Account lockout period must either be all empty or they must all have a value.</p>
Failed login period	<p>The time period (in seconds) during which the failed login attempts are tracked and considered, thus counting toward the maximum failed logins before lockout. Value range is 1–3600 seconds. An empty value indicates that the failed login period is not tracked. Default values are:</p> <ul style="list-style-type: none">• Default enabled value: 900• Disabled value: no failed login period tracking (empty) <p>If the maximum failed logins is not met during the Failed login period, the Maximum failed logins count will reset.</p> <p> NOTE: Failed login period, Maximum failed logins, and Account lockout period must either be all empty or they must all have a value.</p>

Table 18. User account settings attributes (continued)

Attributes	Description
Account lockout period	<p>The time period (in seconds) for which an account will be locked before the user can attempt to login again. Value range is 1–86400 seconds. Default values are:</p> <ul style="list-style-type: none"> • Default enabled value: 3600 • Disabled value: account never locks (empty). <p>NOTE: Account lockout period, Maximum failed logins, and Failed login period must either be all empty or they must all have a value.</p>
Session idle timeout	<p>The time period (in seconds) of idle activity, after which the login session will time out. Value range is: 1–3600 seconds. Default values are:</p> <ul style="list-style-type: none"> • Default enabled value: 600 • Disabled value: 3600 <p>NOTE: An empty value means the session will not timeout due to being idle.</p>
Default admin lockout enabled	<p>Indicates whether account lockout is enabled for admin users. Values are:</p> <ul style="list-style-type: none"> • yes • no <p>Default values are:</p> <ul style="list-style-type: none"> • Default enabled value: no • Disabled value: no

Configure user account settings

Configure the user account settings for a STIG-enabled system. If the `-enabled` option is `yes`, all other subsequent options can be specified. If the subsequent options are not specified when user account settings `-enabled` is set to `yes`, the default enabled value specified below will be used. The disabled value for these options when user account settings `-enabled` is set to `no` are detailed in the attributes table in [Manage user account settings](#) on page 72.

NOTE: This command is not valid for systems that do not have STIG enabled.

Format

```
/user/account/settings set [-enabled {yes | no}] [-passwdMinSize <value>] [-passwdCount <value>] [{-passwdPeriod <value> | -noPasswdPeriod}] [{-maxFailedLogins <value> | -noMaxFailedLogins}] [{-failedLoginPeriod <value> | -noFailedLoginPeriod}] [{-lockoutPeriod <value> | -noLockoutPeriod | -manualUnlock}] [{-sessionIdleTimeout <value> | -noSessionIdleTimeout}] [-defaultAdminLockoutEnabled {yes | no}]
```

Action qualifiers

Qualifier	Description
<code>-enabled</code>	<p>Specifies whether to enable or disable user account settings. Valid values are:</p> <ul style="list-style-type: none"> • yes • no
<code>-passwdMinSize</code>	<p>Specifies the minimum number of characters for a password. Value range is 8–40. If not specified, user account setting default enabled value is 15.</p>

Qualifier	Description
-passwdCount	Specifies the number of passwords that cannot be reused. Valid range: 3 –12. If not specified, user account setting default enabled value is 5.
-passwdPeriod	Specifies the time period (in days) for which a password is valid before it expires. Value range is 1–180 days. If neither this value nor -noPasswdPeriod is specified, user account setting default enabled value is 60. NOTE: This setting is not applicable to local admin user accounts.
-noPasswdPeriod	Specifies that the password does not have an expiry period for local user accounts.
-maxFailedLogins	Specifies the number of consecutive failed login attempts allowed within the failed login period before the account is locked. Value range is 1–10. If neither this value nor -noMaxFailedLogins is specified, user account setting default value is 3. NOTE: If this option is specified, the -failedLoginPeriod and -lockoutPeriod options must also be specified.
-noMaxFailedLogins	Specifies that there is no maximum limit on the number of consecutive failed login attempts. NOTE: If this option is specified, the -noFailedLoginPeriod and -noLockoutPeriod options must also be specified.
-failedLoginPeriod	Specifies the time period (in seconds) during which the failed login attempts are tracked and considered, thus counting toward the maximum failed logins before lockout. Value range is 1–3600 seconds. If neither this value, nor -noFailedLoginPeriod is specified, user account setting default enabled value is 900. NOTE: If this option is specified, the -maxFailedLogins and -lockoutPeriod options must also be specified. If the maximum failed logins is not met during the Failed login period, the Maximum failed logins count will reset.
-noFailedLoginPeriod	Specifies that the number of consecutive failed login attempts within a given time period is not being tracked. NOTE: If this option is specified, the -noMaxFailedLogins and -noLockoutPeriod options must also be specified.
-lockoutPeriod	Specifies the time period (in seconds) for which an account will be locked before the user can attempt to login again. Value range is 1–86400 seconds. If neither this value, nor -noLockoutPeriod is specified, the user account settings default enabled value is 3600. NOTE: If this option is specified, the -maxFailedLogins and -failedLoginPeriod options must also be specified.
-noLockoutPeriod	Specifies that local user accounts will not be locked due to meeting the number of -maxFailedLogins within the -failedLoginPeriod. NOTE: If this option is specified, the -noMaxFailedLogins and -noFailedLoginPeriod options must also be specified.
-manualUnlock	Specifies that the account will remain locked until manually unlocked by an administrator.
-sessionIdleTimeout	Specifies the time period (in seconds) of idle activity, after which the login session will time out. Value range is: 1–3600 seconds. If neither this value, nor -noSessionIdleTimeout is specified, the user account settings default enabled value is 600.
-noSessionIdleTimeout	Specifies that the session will never time out due to being idle.

Qualifier	Description
-defaultAdminLockoutEnabled	Specifies whether account lockout is enabled for admin users. Values are: <ul style="list-style-type: none"> • yes • no If this value is not specified, the user account settings default enabled value is no.

Example 1

The following command enables the user account settings with all default enabled values set when transitioning from a disabled state:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /user/account/settings set -enabled yes
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

Operation completed successfully.
```

Example 2

The following command disables the user account settings, which reverts the account settings back to the original values from before the settings were enabled:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /user/account/settings set -enabled no
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

Operation completed successfully.
```

View user account settings

View the account setting details of all users on the system.

Format

```
/user/account/settings show
```

Example

Displays the user account settings for all users on the system:

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

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

1:      Enabled                      = yes
        Password minimum size       = 15
        Number of previous passwords = 5
        Password period              = 60
        Maximum failed logins        = 3
        Failed login period          = 900
        Account lockout period       = 3600
```

```
Session idle timeout          = 600
Default admin lockout enabled = no
```

Manage support credentials

Manage support credentials settings on the system, including:

- User name of the user account.
- Password of the user account.

The following table lists the support credentials attributes:

Table 19. Support credentials attributes

Attributes	Description
Support user name	Name of the user account.
Support password	Password of the user account.

View support credentials

View the current support credentials.

Format

```
/sys/support/account show
```

Example

The following command displays the support credentials:

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

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection
```

```
1:      Support user name = user1
```

Configure or change support credentials

Configure or change the support account credential attributes associated with your system.

Format

```
/sys/support/account set -user <value> {-passwd <value> | -passwdSecure}
```

Action qualifiers

Qualifier	Description
-user	Specify the user name of the support account.
-passwd	Specify the new password of the support account.
-passwdSecure	Specifies the password in secure mode - the user will be prompted to input the password.

Example

The following command specifies the new password of the support account:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /sys/support/account set -user user1 -passwd Password123
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

Operation completed successfully.
```

Delete support credentials

Delete support credentials.

Format

```
/sys/support/account delete
```

Example

The following command deletes support credentials:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /sys/support/account delete
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

Operation completed successfully.
```

Manage system limits

This CLI command shows limits of the system and various storage resources.

System limits display the size, capacity, and count limits of various system components or storage resources. Some of these limits are associated with alert thresholds. If this threshold is exceeded, the system will generate an alert. Certain limits are license dependent.

Table 20. System limit attributes

Attribute	Description
ID	Limit identifier.
Name	Limit name.
Description	Limit description.
Limit value	Upper boundary of the limit that cannot be exceeded.
Threshold value	Threshold of the specified limit above which the system will generate an alert.
License	License identifier related to the given limit. Some system limits depend on the type of license installed.

View system limits

This command allows you to view system limits, limit thresholds that trigger related alerts, and limits that are based on product feature licenses.

View details about system limits.

Format

```
/sys/limits [{-id <value> | -license <value>}] show
```

Object qualifier

Qualifier	Description
-id	Type the identifier of the limit.
-license	Type a specified license for which to display associated limits.

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/limit show -detail
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

1:      ID          = Limit_Pool_MaxCapacityInTotal
      Name          = Max Storage Capacity
      Description    = The maximum allowed capacity of all storage pools in total.
      Limit value    = 17179869184 (16.0 TB)
      Threshold value = 15032385536 (14.0 TB)
      License        = STORAGE_CAPACITY_LIMIT

2:      ID          = Limit_Pool_MaxCount
      Name          = Max Storage Pool Count
      Description    = The maximum allowed number of storage pools on the system.
      Limit value    = 10
      Threshold value = 8
      License        =

3:      ID          = Limit_VirtualDisk_MinSize
      Name          = Min Virtual Disk Size
      Description    = The minimum allowed size of a virtual disk.
      Limit value    = 10737418240 (10.0 GB)
      Threshold value =
      License        =
```

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 27 provides details on all available switches. The following table lists and describes the attributes for product licenses.

Table 21. License attributes

Attribute	Description
ID	License identifier.

Table 21. License attributes (continued)

Attribute	Description
Name	Name of the license.
Description	Description of the license.
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"> OK (5) — License is active. Degraded/Warning (10) — License will soon expire. Major failure (20) — License has expired. To update a license that has expired or is about to expire, go to the Manage Licenses page in Unisphere.
Health details	Additional health information. See View the switches on page 27, for health information details.

View licenses

View details about installed licenses.

 **NOTE:** The `show` action command on page 21 explains how to change the output format.

Format

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

Object qualifier

Qualifier	Description
-id	Identify the license.

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:      ID           = ISCSI
      Name          = Internet Small Computer System Interface (iSCSI)
      Description    = This license enables you to use the iSCSI
      protocol for   block storage.
      Installed      = yes
      Version        = 1.1
      Issued         = 2009-11-09
      Expires        = 2010-11-09
      Health state   = OK (5)

2:      ID           = CIFS
      Name          = Common Internet File System (CIFS)
```

```
Description = This license enables you to configure and
manage file shares that are exposed using the CIFS protocol.
Installed    = yes
Version      = 1.1
Issued       = 2009-01-19
Expires      = Never
Health state = OK (5)
```

View and accept the End User License Agreement

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 21 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
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

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
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

Operation completed successfully.
```


Manage Unisphere Central Management/Monitoring

Unisphere Central management/monitoring is a centralized approach to monitoring multiple systems at one time.

The following table lists the Unisphere Central management/monitoring attributes:

Table 22. Unisphere Central management/monitoring attributes

Attribute	Description
ID	Unisphere Central management server identifier
Address	Unisphere Central management server network address (network name or IP address)
Certificate	Unisphere Central management server certificate SHA1 hash
Challenge phrase	Passphrase used by the Unisphere Central management server to sign a certificate
SSO enabled	Indicates whether the system uses the remote manager as the authentication server. Valid values are: <ul style="list-style-type: none">• yes• no

Create the remote manager configuration

Format

```
/sys/ur create -addr <value> { -certificate <value> -passphrase <value> | -unsecured }
```

Action qualifiers

Qualifier	Description
-addr	Specifies the Unisphere Central management server name or IP address.
-certificate	Specifies the hash of the existing certificate.
-passphrase	Specifies the challenge phrase for the Unisphere Central manager to sign the certificate.
-unsecured	Skips certificate and challenge phrase.

Example

```
uemcli /sys/ur create -addr 10.10.0.1 -certificate 2fd4e1c67a2d28fced849ee1bb76e7391b93eb12 -passphrase password
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection
```

```
ID = ur_0
Operation completed successfully.
```

View remote manager configuration

Displays the remote manager configuration.

Format

```
/sys/ur show
```

Example

The following command displays the Unisphere Central manager configuration:

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

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection
```

```
1: ID          = ur_0
   Address    = 10.10.0.2
```

Change remote manager configuration

Update a user account with new settings.

Format

```
/sys/ur [-id <value>] set [-addr <value>] [ {-certificate <value> {-passphrase <value> |
-passphraseSecure} | -unsecured} ] [-ssoEnabled {yes | no}]
```

Object qualifier

Qualifier	Description
-id	Identifies the Unisphere Central management server. Optional if there is only one remote manager configured.

Action qualifiers

Qualifier	Description
-addr	Specify the Unisphere Central management server name or IP address.
-certificate	Specify the hash of existing certificate.
-passphrase	Specify the challenge phrase for the remote manager to sign the certificate.
-passphraseSecure	Specifies the challenge phrase in secure mode - the user will be prompted to input the challenge phrase.
-unsecured	Skip certificate and challenge phrase.
-ssoEnabled	Specify whether you want to set the remote manager as the authentication server for the local system. Valid values are yes or no. The default value is set to no, which indicates that the authentication server is the local system.

Example

```
uemcli /sys/ur set -addr 10.10.0.2
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection
```

Operation completed successfully.

Manage remote logging

Log system messages to a maximum of five remote hosts. Create a setting for remote logging for each host that specifies the following:

- The facility that will generate the log messages.
- The network name or IP address of the remote host that will receive the log data.
- The severities that will be sent to the remote host.

Each 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. For the default configuration, the system transfers log information on port 514 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 516 explains viewing details about current logs and alerts on the system.

The following table lists the attributes for remote system logging.

Table 23. Remote logging attributes

Attribute	Description
ID	Remote system log identifier.
Enabled	Indication of whether remote logging is currently enabled. Valid values are (case-insensitive): <ul style="list-style-type: none">• yes• no
Host	IP address or network name of the remote host.
Port	Port number on the remote host. Default is 514.
Protocol	Protocol for transferring the log. Valid values are (case-insensitive): <ul style="list-style-type: none">• tcp• udp
Facility	Facility that will process the log. Value is one of the following (case-insensitive): <ul style="list-style-type: none">• KERN - Kernel messages.• USER (default) - User-level messages.• Syslog - Message generated internally by syslogd.
Severity	Least severities that will be sent to the remote host. Valid values are (case-insensitive): <ul style="list-style-type: none">• emergency• alert• critical• error• warning• notice• info• debug



Create remote logging configuration

Create remote logging configuration.

Format

```
/sys/rlog create [-enabled {yes|no}] [-host <value>] [-port <value>] [-protocol {udp|tcp}]  
[-facility {KERN | USER | Syslog}] [-severity {emergency | alert | critical | error |  
warning | notice | info | debug}]
```

Object qualifier

Qualifier	Description
-enabled	<p>Specify to enable remote system logging. Valid values are (case-insensitive):</p> <ul style="list-style-type: none">• yes• no <p>If you specify <code>yes</code>, include <code>-host <value></code>, where <code>value</code> is the IP address of the target remote host that will receive the logs.</p>
-host	<p>Type the IP address or network name of the remote host that will receive the log files. Value is one of the following:</p> <ul style="list-style-type: none">• <IPv4 address>• <IPv6 address>• <network name> <p> NOTE: The new IP address and port combination cannot be identical to any existing remote host address.</p>
-port	<p>Type the port number on which the host will receive the transferred log information. Default is <code>514</code>.</p>
-protocol	<p>Type the protocol for transferring the log files. Valid values are (case-insensitive):</p> <ul style="list-style-type: none">• tcp• udp
-facility	<p>Type the facility that will process the log files. Value is one of the following (case-insensitive):</p> <ul style="list-style-type: none">• KERN—Kernel messages.• USER (default)—User-level messages.• Syslog—Message generated internally by syslog.
-severity	<p>Type the least severities of the log files that will be sent to the remote host. Value is one of the following (case-insensitive):</p> <ul style="list-style-type: none">• emergency• alert• critical• error• warning• notice• info• debug <p> NOTE: For example, <code>debug</code> is the default severity. When it is typed, all user/audit logs are sent to the remote host. When <code>emergency</code> is typed, only logs of emergency severity are sent to the remote host.</p>

Example

The following command configures remote system logging with these settings:

- Remote target host is 10.10.10.10

- Uses host port 8181.
- Uses protocol tcp.
- Uses the syslog facility.
- Uses the notice severity.

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /sys/rlog set -enabled yes -host 10.10.10.10 -port 8181 -protocol TCP -facility syslog -severity notice
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

Operation completed successfully.
```

View settings for remote logging

View remote logging settings.

Format

```
/sys/rlog show
```

Object qualifier

Qualifier	Description
-id	Type the ID that identifies the remote host. Optional if there is only one remote host configured.

Example

The following command displays the settings for remote system logging:

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

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

1:      ID      = RemoteSysLogPort_0
      Enabled = yes
      Host     = 10.0.0.1
      Port     = 514
      Protocol = UDP
      Facility = KERN
      Severity = DEBUG
```

Change remote logging configuration

Update remote logging configuration with new settings.



Format

```
/sys/rlog [-id <value>] set [-enabled {yes|no}] [-host <value>] [-port <value>] [-protocol {udp|tcp}] [-facility {KERN | USER | Syslog}] [-severity {emergency | alert | critical | error | warning | notice | info | debug}]
```

Object qualifier

Qualifier	Description
-id	Type the ID that identifies the remote host. Optional if there is only one remote host configured.

Action qualifier

Qualifier	Description
-enabled	<p>Specify to enable remote system logging. Valid values are (case-insensitive):</p> <ul style="list-style-type: none">• yes• no <p>If you specify <code>yes</code>, include <code>-host <value></code>, where <code>value</code> is the IP address of the target remote host that will receive the logs.</p>
-host	<p>Type the IP address or network name of the remote host that will receive the log files. Value is one of the following:</p> <ul style="list-style-type: none">• <code><IPv4 address></code>• <code><IPv6 address></code>• <code><network name></code> <p> NOTE: The new IP address and port combination cannot be identical to any existing remote host address.</p>
-port	Type the port number on the remote host. Default is <code>514</code> .
-protocol	<p>Type the protocol for transferring the log files. Valid values are (case-insensitive):</p> <ul style="list-style-type: none">• <code>tcp</code>• <code>udp</code>
-facility	<p>Type the facility that will process the log files. Value is one of the following (case-insensitive):</p> <ul style="list-style-type: none">• <code>KERN</code> - Kernel messages.• <code>USER</code> - User-level messages.• <code>Syslog</code> - Message generated internally by syslog.
-severity	<p>Type the least severities of the log files that will be sent to the remote host. Value is one of the following (case-insensitive):</p> <ul style="list-style-type: none">• <code>emergency</code>• <code>alert</code>• <code>critical</code>• <code>error</code>• <code>warning</code>• <code>notice</code>• <code>info</code>• <code>debug</code> <p> NOTE: For example, <code>debug</code> is the default severity. When it is typed, all user/audit logs are sent to the remote host. When <code>emergency</code> is typed, only logs of emergency severity are sent to the remote host.</p>

Example

The following command configures remote system logging with these settings:

- Remote target host is `10.64.74.12`
- Uses host port `514`.
- Uses protocol `udp`.
- Uses the `KERN` facility.
- Uses the `critical` severity.


```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /sys/rlog set -enabled yes -host 10.64.74.12 -port 514 -protocol UDP -facility KERN -severity critical
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection
```

```
ID = RemoteSysLogPort_0
Operation completed successfully.
```

Delete remote logging configuration

Delete a remote logging configuration.

 **NOTE:** If only one remote destination exists, you are not allowed to delete it.

Format

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

Object qualifier

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

Example

The following command deletes remote host RemoteSysLogPort_1:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /sys/rlog -id RemoteSysLogPort_1 delete
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection
```

```
Operation completed successfully
```

Manage system certificates

Interface to manage certificates for different components on the storage system.

The following table lists the attributes for certificates:

Table 24. Certificate attributes

Attribute	Description
ID	Certificate identifier.
Type	Certificate type. Valid certificate types are: <ul style="list-style-type: none">• CA• Server• Client• TrustedPeer
Service	Service with which the certificate is associated. The services supported are: <ul style="list-style-type: none">• Mgmt_LDAP

Table 24. Certificate attributes (continued)

Attribute	Description
	<ul style="list-style-type: none"> • Mgmt_KMIP • VASA_HTTP
Scope	Scope of the certificate. The certificate can have local or global scope. If global, there will be no value. If local, value will be the ID of the scope. For example, if the scope of the certificate associated with Mgmt_LDAP service is NAS server nas01, the value of the property would be nas01.
Trust anchor	Indicates whether the certificate is trusted as end-of-chain for peer certificate verification. Valid values are: <ul style="list-style-type: none"> • yes • no
Version	Certificate version.
Serial number	Certificate serial number.
Signature algorithm	Certificate signature algorithm.
Issuer name	Name of the certificate issuer.
Valid from	Date and time when the certificate became valid.
Valid to	Date and time when the certificate will expire.
Subject	Certificate subject.
Subject alternative name	Certificate subject alternative name.
Public key algorithm	Certificate public key algorithm.
Key length	Certificate key length.
Thumbprint algorithm	Certificate thumbprint algorithm.
Thumbprint	Certificate thumbprint.
Private key available	Indicates whether the certificate has an associated private key. Based on availability, valid values are: <ul style="list-style-type: none"> • yes • no

View certificates information

View details about a certificate.

Format

```
/sys/cert [ -type { CA | Server | Client | TrustedPeer } ] [ -service { Mgmt_LDAP | Mgmt_KMIP | VASA_HTTP } [ -scope <value> ] ] [ -id <value> ] show
```

Object qualifier

Qualifier	Description
-id	Identifies the certificate.
-type	Identifies the type of certificate.

Qualifier	Description
-service	Identifies the Service. Valid values are: <ul style="list-style-type: none"> • Mgmt_LDAP • Mgmt_KMIP • VASA_HTTP
-scope	Identifies the scope of the certificate.

Example

The following command displays a VASA HTTP certificate information:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /sys/cert -id vasa_http-vc1-cacert-1 show -detail
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

1:      ID                      = vasa_http-vc1-cacert-1
      Type                     = CA
      Service                   = VASA_HTTP
      Scope                     =
      Trust anchor              = no
      Version                   = 2
      Serial number             = 04:00:00:00:00:01:21:58:53:08:A2
      Signature algorithm       = SHA256WithRSAEncryption
      Issuer name               = CN = GlobalSign O = GlobalSign OU = GlobalSign Root CA
- R3
      Valid from               = 2009-03-18 10:00:00
      Valid to                 = 2029-03-18 10:00:00
      Subject name              = CN = GlobalSign O = GlobalSign OU = GlobalSign Root CA
- R3
      Subject alternative name =
      Public key algorithm     = RSA
      Key length                = 2048
      Thumbprint algorithm     = SHA1
      Thumbprint               = d6 9b 56 11 48 f0 1c 77 c5 45 78 c1 09 26 df 5b 85 69
76 ad
      Private key available    = no
```

Delete system certificate

Deletes an X509 certificate.

Format

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

Object qualifier

Object	Description
-id	Identifies the certificate.

Example

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /sys/cert -id vasa_http-vc1-servercert-1 delete
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection
```

```
Operation completed successfully.
```

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 92 explains how to set up task rules. [Manage snapshots](#) on page 435 explains how to create snapshots manually and manage existing snapshots.

Each protection schedule is identified by an ID.

The following table lists the attributes for protection schedules.

Table 25. 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">• <code>system</code>— Defined by the system• <code>user</code>— Defined by a user
Rules	List of IDs for each task rule in the schedule. Manage task rules on page 92 provides details about schedule rules.
Sync replicated	The state indicating to the user whether the schedule is synchronously replicated to the remote system. Value is one of the following: <ul style="list-style-type: none">• <code>no</code>— The schedule is created locally and will not be replicated.• <code>yes</code>— The schedule is in sync with the remote system.
Last modified time	Last modified time of the schedule.

View protection schedules

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

 **NOTE:** The `show` action command on page 21 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
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection


1:      ID          = LessProtectionID
      Name          = Less Protection
      Type          = System
      Rules         = RULE_1, RULE2
      Sync replicated = no

2:      ID          = DefaultProtectionID
      Name          = Default Protection
      Type          = System
      Rules         = RULE_3
      Sync replicated = no

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

Delete protection schedules

Delete a user-defined protection schedule. You cannot delete a system-defined schedule or schedules that are associated or assigned to storage resources.

 **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
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection
```

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 90 explains how to view and delete protection schedules.

The following table lists the attributes for task rules.

Table 26. Task rule attributes

Attribute	Description
ID	ID of the rule.
Type	Type of rule, which specifies when a task executes. Valid values are: <ul style="list-style-type: none">• <code>hoursinterval</code> - Task executes on an interval of the specified number of hours or minutes within an hour.• <code>hourslist</code> - Task executes everyday on the specified hours and, optionally, on a specific minute within the specified hour.• <code>daysinterval</code> - Task executes on an interval of the specified number of days and, optionally, on a specific hour of each specified day.• <code>weekdayslist</code> - Task executes on the specified days of the week or on a specific hour of each specified day.• <code>monthdayslist</code> - Task executes each month on a specified day and time.
Frequency	Frequency that a task executes.
Keep for	For snapshots, the amount of time the system retains a snapshot before deleting it.
Allow auto-delete	For snapshots, indicates whether the snapshot can be deleted automatically. Valid values are: <ul style="list-style-type: none">• <code>yes</code> — The system can delete the snapshot automatically.• <code>no</code> — The system cannot delete the snapshot automatically.
Access	For snapshots, indicates whether the snapshot created by this schedule is a checkpoint, or is set to read/write. Valid values are: <ul style="list-style-type: none">• <code>ckpt</code> — The snapshot is a read-only checkpoint• <code>share</code> — The snapshot is set to read/write for users to create CIFS (SMB) shares of NFS exports.

Create task rules


Create a task rule and add to an existing schedule. If a schedule does not exist, a new one is created.


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> | -allowAutoDelete {yes | no}}] [-access {ckpt  
| share}] [-syncRep {yes | no}]
```

Action qualifiers

Qualifier	Description
-schedId	Type the ID of an existing protection schedule to which to assign the rule. View protection schedules on page 90 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. Valid values are: <ul style="list-style-type: none"> hoursinterval — Task executes on an interval of the specified number of hours or minutes within an hour. hourslist — Task executes everyday on the specified hours and, optionally, on a specific minute within the specified hour. Supports up to two specified hours. daysinterval — Task executes on an interval of the specified number of days and, optionally, on a specific hour of each specified day. weekdayslist — Task executes on the specified days of the week or on a specific hour of each specified day. Supports up to seven specified values, including all the days in a week. monthdayslist — Task executes each month on a specified day and time. Supports one day value only.
-every (used with -type)	If the value of -type is hoursinterval or daysinterval, type the time interval when the task will execute. Valid values are: <ul style="list-style-type: none"> hoursinterval — Number of hours within the range 1 - 24. daysinterval — Number of days within the range 1 - 31.
-hours (used with -type)	If the value of -type is hourslist, type a comma-separated list of the hours of the day when the task will execute. The range is 0 - 23.
-at (used with -type)	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 -type. Valid values are: <ul style="list-style-type: none"> hoursinterval or hourslist - Type the number of minutes after the hour within the range 0 - 59. Default is 0. daysinterval, weekdayslist, or monthdayslist - Type the time of a day in the following format: <HH>[:MM] where HH is the hour of the day and MM represents the minutes within the specified hour. Value range is 0:00 - 23:59. Default value is 0:00.
-days (used with -type)	If the value of -type is weekdayslist or monthdayslist, type the days of the week or the day of the month when the task will execute: <ul style="list-style-type: none"> weekdayslist — Type a comma-separated list of the days of the week. Valid values are: <ul style="list-style-type: none"> mon — Monday tue — Tuesday wed — Wednesday thu — Thursday fri — Friday sat — Saturday sun — Sunday monthdayslist — Type the day of the month within the range 1 - 31. <p> NOTE: For monthdayslist, you can specify only one day of the month.</p>
-keepFor	Type the number of days or hours the system will retain a snapshot before deleting it. Use the following format: <value>[<qualifier>] where: <ul style="list-style-type: none"> value — Type the number of hours or days. Value is: <ul style="list-style-type: none"> hours — Number of hours within the range 1 - 8760. days — Number of days within the range 1 - 365. qualifier — Type the value qualifier. Value is one of the following:

Qualifier	Description
	<ul style="list-style-type: none"> o h — Indicates hours. o d — Indicates days. Default value is 1h (1 hour).
-allowAutoDelete	Specify whether the system can automatically delete the snapshot or snapshot set. Valid values are: <ul style="list-style-type: none"> • yes (default) • no
-access	Specify whether the snapshot is a read-only checkpoint, or read/write for CIFS (SMB) shares or NFS exports. Valid values are: <ul style="list-style-type: none"> • ckpt (default) • share
-syncRep	Specify whether this schedule is synchronously replicated. All changes done to the replicated schedule on the local system apply to the remote system automatically and conversely. Valid values are: <ul style="list-style-type: none"> • yes • no <p> NOTE: If a synchronous remote connection is established, the default value is yes, otherwise it is no.</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
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection
```

```
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 MyScheduleID.
- Takes a snapshot everyday at 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 MyScheduleID -type hourslist -hours "8,20" -at 30
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection
```

```
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
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection
```

```
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
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection
```

```
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
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection
```

```
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 21 explains how to change the output format.

Format

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

Object qualifier

Qualifier	Description
-id	Type the ID of a rule.
-sched	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 -sched SCHD_3 show
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

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 8:30, 20:30
      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
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

Operation completed successfully.
```

Manage jobs

Manage the operations that are running in the background.

The following table lists the attributes for jobs.

Table 27. Jobs attributes

Attribute	Description
ID	Job identifier.
Type	Job type. Value is one of the following: <ul style="list-style-type: none">• Provisioning• Snapshot• Snapshot schedule
Title	Job title.
State	Job state. Value is one of the following: <ul style="list-style-type: none">• Queued• Running• Suspended• Completed• Completed with problems• Failed• Rolling back
Result description	Describes the result of the step.
Step	Current step.
User	User who started the job.
Start time	Time when the job was started.
Elapsed time	Elapsed time for the current job.
Estimated time left	Time remaining to complete the current job.
Percent complete	Job progress in percent.
Associated object	Object or storage resource affected by the job. Only one object is associated with each job. Format is shown as: <id> (<object type>)

View list of jobs

View the list of existing jobs.

Format

```
/sys/task/job [{-id <value> | -active | -failed | -completed}] show
```

Object qualifier

Qualifier	Description
-id	Identifies the job.
-active	Show only unfinished jobs (Queued, Running, Suspended, Rolling back).
-failed	Show only failed jobs.
-completed	Show only successfully completed and completed with problems jobs.

Example 1

The following command displays a list of all jobs:

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

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

1:      ID              = N-26
      Type              = Provisioning
      Title             = Create or modify storage resource
      State             = Completed
      Step              = 2 of 2 (Apply iSCSI hosts)
      Percent complete  = 100%
```

Example 2

The following command displays a list of all jobs:

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

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

1:      ID              = N-11
      Type              = Storage resource provisioning
      Title             = Create storage resource
      State             = Completed
      Result description = Success
      User              = Local/admin
      Step              =
      Start time        = 2016-06-17 09:47:36
      Elapsed time      = 1m 26s
      Estimated time left =
      Percent complete  = 100%
      Associated object  = fs_3 (/stor/prov/fs)
```

Resume a job

Resumes an existing job. Could be applied to the suspended job only.

Format

```
/sys/task/job -id <value> resume
```

Object qualifier

Qualifier	Description
-id	Identifies the job.

Example

The following command resumes an existing job.

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /sys/task/job -id N-23564 resume
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

Operation completed successfully.
```

Cancel a job

Cancels an existing job without rolling back. Could be applied to the suspended or queued job only.

Format

```
/sys/task/job -id <value> cancel
```

Object qualifier

Qualifier	Description
-id	Identifies the job.

Example

The following command resumes an existing job.

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /sys/task/job -id N-23654 cancel
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

Operation completed successfully.
```

Delete jobs

Deletes a job or a group of jobs. Active jobs cannot be deleted.

Format

```
/sys/task/job {-id <value> | -failed | -completed} delete
```

Object qualifier

Qualifier	Description
-id	Identifies the job.
-failed	Identifies jobs that have failed.
-completed	Identifies jobs that have completed successfully or completed with problems.

Example

The following command deletes an existing job.

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /sys/task/job -id N-23654 delete
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

Operation completed successfully.
```

Manage job step

Manage the steps of the specified job.

The following table lists the attributes for job step.

Table 28. Job step attributes

Attribute	Description
Title	Step title.
Status	Step status. Value is one of the following: <ul style="list-style-type: none">• Queued• Running• Completed• Failed
Execution result code	The error code of the operation.
Execution result description	The error message of the operation.
Rollback result code	The error code of the rollback.
Rollback result description	The error message of the rollback.
Details	Additional information. Format: key: "value", key: "value",...
Associated object	Object or storage resource affected by the job. Only one object is associated with each job step. Format is shown as: <id> (<object type>)

View list of steps in a job

Displays a list of steps of the specified job.

Format

```
/sys/task/job/step -jobId <value> show
```

Object qualifier

Qualifier	Description
-jobId	Identifies the job.

Example 1

The following command displays a list of steps of the specified job.

```
uemcli /sys/task/job/step -jobId N-23654 show
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

1:  Title                = Extend storage pool
    Status                = Completed
    Execution result code  = 0
    Execution result description =
    Rollback result code  = 0
    Rollback result description =
    Details                = ID: "local_pool_8"; Name: "SASx6_2"

2:  Title                = Create application
    Status                = Completed
    Execution result code  = 0
    Execution result description =
    Rollback result code  = 0
    Rollback result description =
    Details                = ID: "local_pool_8"; Name: "SASx6_2"

3:  Title                = Create file system
    Status                = Running
    Execution result code  = 0
    Execution result description =
    Rollback result code  = 0
    Rollback result description =
    Details                = ID: fs_99; Name: JobTest11

4:  Title                = Create NFS share
    Status                = Queued
    Execution result code  = 0
    Execution result description =
    Rollback result code  = 0
    Rollback result description =
    Details                = ID: nfs_45; Name: JobTest11

5:  Title                = Finalize allocation
    Status                = Queued
    Execution result code  = 0
    Execution result description =
    Rollback result code  = 0
    Rollback result description =
    Details                = ID: local_pool_8; Name: SASx6_2
```

Example 2

The following command displays a detailed list of steps of the specified job.

uemcli /sys/task/job/step -jobId N-11 show -detail

Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

```
1:      Title                               = Create storage resource
      Status                               = Completed
      Execution result code                 = 0
      Execution result description          =
      Rollback result code                 = 0
      Rollback result description          =
      Details                             = ID: "res_3"; Name: "testFS3"
      Associated object                     =

2:      Title                               = Create file system
      Status                               = Completed
      Execution result code                 = 0
      Execution result description          =
      Rollback result code                 = 0
      Rollback result description          =
      Details                             = ID: "fs_3"; Name: "testFS3"
      Associated object                     = fs_3 (/stor/prov/fs)

3:      Title                               = Add filesystem to storage resource
      Status                               = Completed
      Execution result code                 = 0
      Execution result description          =
      Rollback result code                 = 0
      Rollback result description          =
      Details                             = ID: "res_3, fs_3"
      Associated object                     =
```

Configure Network Communication

This chapter contains the following topics:

Topics:

- [Manage NAS servers](#)
- [Manage VLANs](#)
- [Manage tenants](#)
- [Manage CIFS Servers](#)
- [Manage NFS servers](#)
- [Manage Common Anti Virus Agent \(CAVA\)](#)
- [Manage Events Publishing configuration settings](#)
- [Manage CEPA pool configuration settings](#)
- [Manage VMware NAS protocol endpoint servers](#)
- [Manage reverse CHAP for mutual CHAP authentication](#)
- [Set up iSNS for iSCSI storage](#)
- [Manage iSCSI configuration](#)
- [Manage iSCSI nodes \(servers\)](#)
- [Manage Ethernet ports](#)
- [Manage SAS ports \(physical deployments only\)](#)
- [Manage FC ports](#)
- [Manage uncommitted ports](#)
- [Manage Management network interfaces](#)
- [Manage network interfaces](#)
- [Manage static IP routes](#)
- [Manage link aggregations](#)
- [Manage Fail-safe networking \(physical deployments only\)](#)
- [Manage DNS settings](#)
- [Manage NTP server settings](#)
- [Manage NIS server domains](#)
- [Manage SMTP server settings](#)
- [Manage NDMP server settings](#)
- [Manage LDAP settings](#)
- [Utility commands](#)
- [Manage Distributed Hierarchical Storage Management](#)
- [Manage DHSM Connection](#)
- [Manage the tie breaker node \(dual-SP virtual deployments only\)](#)
- [Manage a tie breaker node configuration \(dual-SP virtual deployments only\)](#)

Manage NAS servers

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

NAS servers run on each SP and communicate with network hosts through SP ports. Once you configure a NAS server, you can then create file systems from which you export NFS or SMB network shares. Configured hosts map or mount the network shares to access the file system storage.

Each NAS server is identified by an ID.

The following table lists the attributes for NAS servers.

Table 29. NAS server attributes

Attributes	Description
ID	ID of the NAS server.
Name	Name of the NAS server.
Health state	Health state of the NAS server. The health state code appears in parentheses. Value is one of the following: <ul style="list-style-type: none"> Unknown (0) — Status is unknown. OK (5) — Working correctly. OK BUT (7) — Configuration is not complete. Degraded/Warning (10) — Working and performing all functions, but the performance may not be optimum. Minor failure (15) — NAS server has faulted. Major failure (25) — Failed and recovery may not be possible. This condition has resulted in data loss and should be remedied immediately.
Health details	Additional health information. See Appendix A, Reference, for details.
SP	Primary SP on which the NAS server runs. <i>NOTE:</i> 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).
Storage pool	Associated storage pool identifier.
Tenant	Identifier and name of the tenant.
Interface	ID of the network interface assigned to the NAS server that defines the server IP address and allows the server to communicate with the network and hosts. Manage network interfaces on page 178 explains how to configure network interfaces on the system. <i>NOTE:</i> It is allowable to remove the last interface of the server.
CIFS enabled	Indicates whether SMB file systems are enabled on the NAS server. Value is yes or no. Default is no. SMB file systems provide support for SMB network shares.
Multiprotocol sharing enabled	Indicates whether multiprotocol sharing is enabled for all file systems on the NAS server. Valid values are: <ul style="list-style-type: none"> yes no
Unix directory service	Directory service used for looking up identity information for Unix such as UIDs, GIDs, net groups, and so on. Valid values are: <ul style="list-style-type: none"> local nis ldap localThenNis localThenLdap none (default) <i>NOTE:</i> A value other than the default is required for accurate multiprotocol files sharing between Unix and Windows users.
Auto user mapping enabled	Applies when multiprotocol sharing mode is enabled. Indicates whether a Windows user who is not mapped to a known Unix/Linux username is allowed to access the NAS server's files. <ul style="list-style-type: none"> yes— The system generates an internal UID for the Windows user and allows access to the NAS server's files through Windows. no (default)— The Windows authentication fails unless there is a default Unix username configured.

Table 29. NAS server attributes (continued)

Attributes	Description
Default Unix username	Default Unix user name or Unix ID that grants file access in the multiprotocol sharing mode. This user name is used for Windows users when the corresponding Unix/Linux user name is not found by the mapping mechanism. The Unix ID format is @uid=xxxx,gid=yyyy@, where xxxx and yyyy are the decimal numerical values of the UID and the primary GID, respectively. When using this ID, the user does not need to be defined in the UDS.
Default Windows username	Default Windows user name that grants file access in the multiprotocol sharing mode. This user name is used for Unix users when the corresponding Windows user name is not found by the mapping mechanism.
Replication type	Indicates in what asynchronous replication this NAS Server is participating. Valid values are: <ul style="list-style-type: none"> • none • local • remote
Synchronous replication type	Indicates in what synchronous replication this NAS Server is participating. Valid values are: <ul style="list-style-type: none"> • none • remote
Replication destination	Indicates whether the NAS server is a replication destination. Valid values are: <ul style="list-style-type: none"> • yes • no <p>i NOTE: This attribute does not apply to the replication status of related file systems. Use the <code>stor/prov/fs show</code> command to view the replication status of file systems.</p>
Backup only	Indicates whether the NAS server is used as backup. This attribute reflects that the NAS server cannot be the production site. This means both planned failover and unplanned failover are disallowed in the backup only NAS server associated replication session.
Migration destination	Indicates whether the NAS server is a destination for a NAS import session. Valid values are: <ul style="list-style-type: none"> • yes • no
Username translation	Indicates whether a Unix to/from Windows user name mapping is enabled. Valid values are: <ul style="list-style-type: none"> • yes • no
Packet Reflect enabled	Indicates whether the reflection of outbound (reply) packets through the same interface that inbound (request) packets entered is enabled. Valid values are: <ul style="list-style-type: none"> • yes • no (default)
Preferred production interfaces overridden	Indicates whether the production preferred interfaces are overridden on the replication destination.
Preferred production IPv4 interface	Specifies the settings for the preferred production IPv4 interface. Valid values are: <ul style="list-style-type: none"> • <interface ID> • auto
Preferred production IPv6 interface	Specifies the settings for the preferred production IPv6 interface. Valid values are: <ul style="list-style-type: none"> • <interface ID> • auto

Table 29. NAS server attributes (continued)

Attributes	Description
Preferred backup IPv4 interface	Specifies the settings for the preferred backup and disaster recovery test IPv4 interface. Valid values are: <ul style="list-style-type: none"> • <interface ID> • auto
Preferred backup IPv6 interface	Specifies the settings for the preferred backup and disaster recovery test IPv6 interface. Valid values are: <ul style="list-style-type: none"> • <interface ID> • auto
Source preferred production IPv4 interface	Specifies replicated production IPv4 preferred interface settings on the replication destination. If overridden, this may be different from the Preferred production IPv4 interface. Valid values are: <ul style="list-style-type: none"> • <interface ID> • auto
Source preferred production IPv6 interface	Specifies replicated production IPv4 preferred interface settings on the replication destination. If overridden, this may be different from the Preferred production IPv6 interface. Valid values are: <ul style="list-style-type: none"> • <interface ID> • auto
File space used	Displays the total file space used for the specified NAS server.
Data Reduction space saved	Specifies the size saved when using data reduction for this NAS server.
Data Reduction percent	Specifies the storage percentage saved when using data reduction, compared to the total size used by this NAS server.
Data Reduction ratio	Specifies the ratio between data without data reduction, and data after data reduction savings for this NAS server.

Create a NAS server


Create a NAS server.


 **NOTE:** The NFSv3 protocol is enabled by default when creating a NAS server.

Format

```
/net/nas/server create -name <value> -sp <value> {-pool <value> | -poolName <value>}
[-tenant <value>] [-mpSharingEnabled {no | yes [-autoUserMappingEnabled {yes | no}]} [-
unixDirectoryService {local | ldap | nis | localThenNis | localThenLdap | none}] [-
defaultUnixUser <value>] [-defaultWindowsUser <value>]] [-replDest {yes [-backupOnly {yes
| no}] | no}] [-enablePacketReflect {yes | no}]
```

Action qualifiers

Qualifier	Description
-name	Specifies the NAS server name. <p> NOTE: NAS 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 NAS 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.</p>

Qualifier	Description
-sp	Specifies the parent SP for the NAS server. Value is SPA or SPB.
-pool	Specifies the ID of the storage pool for the NAS server.
-poolName	Specifies the name of the storage pool for the NAS server.
-tenant	Specifies the tenant identifier.  NOTE: If a tenant is not specified, the NAS server is created in the default network namespace.
-mpSharingEnabled	Indicates whether multiprotocol sharing mode is enabled. Value is yes or no (default).
-unixDirectoryService	Directory Service used for querying identity information for Unix (such as UIDs, GIDs, net groups). Valid values are: <ul style="list-style-type: none"> • nis • ldap • local • none (default) • localThenNis • localThenLdap
-autoUserMappingEnabled	Indicates whether a Windows user who is not mapped to a known Unix/Linux username is allowed to access the NAS server's files. Valid values are: <ul style="list-style-type: none"> • yes— The system generates an internal UID for the Windows user and allows access to the NAS server's files through Windows. • no (default)— The Windows authentication fails unless there is a default Unix username configured.
-defaultUnixUser	Default Unix user name or Unix ID that grants file access in the multiprotocol sharing mode. This user name or ID is used when the corresponding Unix/Linux user name or ID is not found by the mapping mechanism. The Unix ID format is @uid=xxx,gid=yyy@, where xxx and yyy are the decimal numerical values of the UID and the primary GID, respectively. When using this ID, the user does not need to be defined in the UDS.
-defaultWindowsUser	Default Windows user name that grants file access in the multiprotocol sharing mode. This user name is used when the corresponding Windows user name is not found by the mapping mechanism.
-replDest	Replication destination settings for the NAS server. When this option is set to yes, only mandatory parameters may be included. All other optional parameters will be inherited from the source NAS server. Valid values are: <ul style="list-style-type: none"> • yes • no (default)
-backupOnly	Indicates whether to create NAS server as backup only. The backup only NAS server cannot be a production site, which means both planned failover and unplanned failover are disallowed in a backup only NAS server associated replication session. Valid values: <ul style="list-style-type: none"> • yes • no
-enablePacketReflect	Indicates whether the reflection of outbound (reply) packets through the same interface that inbound (request) packets entered is enabled. Valid values are: <ul style="list-style-type: none"> • yes (default) • no

Example

The following command creates a NAS server with these settings:

- Name is NasServer_1.

- Associated with SP A.
- Associated with storage pool pool_0.
- IP Packet Reflect is enabled.
- The ID of the new NAS server is ID nas_1.

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /net/nas/server create -name NasServer_1 -sp spa -pool pool_0 -enablePacketReflect yes
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

ID = nas_1
Operation completed successfully.
```

View NAS servers

View details about configured NAS servers, including their name, ID, and whether they have enabled support for CIFS (SMB) file systems or NFS file systems. You can filter on the NAS server ID.

 **NOTE:** The `show` action command on page 21 explains how to change the output format.

Format

```
/net/nas/server [{-id <value> | -name <value> | -tenant {<value> | none}}] show
```

Object qualifiers

Qualifier	Description
-id	Type the ID of a NAS server.
-name	Type the NAS server name.
-tenant	Type the tenant identifier.

Example

The following command displays all details for a list of all configured NAS servers:

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

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

1:  ID              = nas_1
    Name            = MyVDM1
    NetBIOS name    =
    SP              = spa
    Storage pool    = pool_1
    Tenant          =
    Interface       =
    NFS enabled     = yes
    NFSv4 enabled   = no
    CIFS enabled    = no
    Workgroup       =
    Windows domain  =
    Multiprotocol sharing enabled = no
    Unix directory service = none
    Auto user mapping enabled =
    Default Unix username =
    Default Windows username =
```


```

Extended Unix credentials enabled      = no
Credentials cache retention            = 15m
Username translation                   = 
Packet Reflect enabled                 = yes
Health state                          = OK (5)
Health details                        = "The component is operating
normally. No action is required."
Replication type                      = none
Synchronous replication type          = none
Replication destination               = no
Backup only                          = no
Migration destination                 = no
Preferred production interfaces overridden = 
Preferred production IPv4 interface   = auto
Preferred production IPv6 interface   = auto
Preferred backup and DR test IPv4 interface = auto
Preferred backup and DR test IPv6 interface = auto
Source preferred production IPv4 interface = 
Source preferred production IPv6 interface = 
File space used                       = 8945901568 (8.3G)
Compression space saved               = 0
Compression percent                   = 0%
Compression ratio                     = 1:1
Data Reduction space saved            = 0
Data Reduction percent                = 0%
Data Reduction ratio                  = 1:1

```

Change NAS server settings

Modify an existing NAS server.

 **NOTE:** [Manage network interfaces](#) on page 178 explains how to modify the network interfaces associated with a NAS server.

Format

```

/net/nas/server {-id <value> | -name <value> } set [-name <value>] [-sp {spa |
spb}] [-mpSharingEnabled {yes | no}] [-unixDirectoryService {ldap | nis | none}] [-
autoUserMappingEnabled {yes | no}] [{-defaultAccessDisabled | [-defaultUnixUser <value>]} [-
defaultWindowsUser <value>]] [-enablePacketReflect {yes | no}] [-replDest {yes | no}] [-
backupOnly {yes | no}] [-preferredProductionOverride { no | yes }][[-preferredProductionIPv4
{ auto | <value>}] [-preferredProductionIPv6 { auto | <value>}] [-preferredBackupIPv4 {auto
| <value>}] [-preferredBackupIPv6 {auto | <value>}


```

Object qualifiers

Qualifier	Description
-id	Type the ID of the NAS server to change.
-name	Type the name of the NAS server to change.

Action qualifiers

Qualifier	Description
-name	Shared folder server name.
-sp	Owner SP. Valid values are: <ul style="list-style-type: none"> spa spb

Qualifier	Description
-mpSharingEnabled	Indicates whether multiprotocol sharing mode is enabled. Valid values are: <ul style="list-style-type: none"> • yes • no  NOTE: You cannot disable multiprotocol file sharing for a NAS server once a file system is created on that NAS server.
-unixDirectoryService	Directory Service used for querying identity information for Unix (such as UIDs, GIDs, net groups). Valid values are: <ul style="list-style-type: none"> • nis • ldap • local • none • localThenNis • localThenLdap
-defaultAccessDisabled	Disables file access when no user mapping mechanism is found.
-autoUserMappingEnabled	Indicates whether a Windows user who is not mapped to a known Unix/Linux username is allowed to access the NAS server's files. Valid values are: <ul style="list-style-type: none"> • yes. The system generates an internal UID for the Windows user and allows access to the NAS server's files through Windows. • no (default). The Windows authentication fails unless there is a default Unix username configured.
-defaultUnixUser	Default Unix user name or Unix ID that grants file access in the multiprotocol sharing mode. This user name or ID is used when the corresponding Unix/Linux user name or ID is not found by the mapping mechanism. The Unix ID format is @uid=xxx,gid=yyy@, where xxx and yyy are the decimal numerical values of the UID and the primary GID, respectively. When using this ID, the user does not need to be defined in the UDS.
-defaultWindowsUser	Default Windows user name that grants file access in the multiprotocol sharing mode. This user name is used when the corresponding Windows user - defaultWindowsUser name is not found by the mapping mechanism.
-enablePacketReflect	Indicates whether the reflection of outbound (reply) packets through the same interface that inbound (request) packets entered is enabled. Valid values are: <ul style="list-style-type: none"> • yes • no
-replDest	Replication destination settings for the NAS server. Valid values are: <ul style="list-style-type: none"> • yes • no
-backupOnly	Indicates whether the NAS server is used as backup. Only a replication destination NAS server can be set as backup only. This attribute reflects that the NAS server cannot be the production site. This means both planned failover and unplanned failover are disallowed in the backup only NAS server associated replication session. Valid values are: <ul style="list-style-type: none"> • yes • no
-preferredProductionOverride	Override the replicated production interfaces "preferred interface" settings. Valid values are: <ul style="list-style-type: none"> • yes • no
-preferredProductionIPv4	Production IPv4 preferred interface settings. The interface must be IPv4 and belong to this server. Valid values are: <ul style="list-style-type: none"> • <interface ID>

Qualifier	Description
	<ul style="list-style-type: none"> • auto
-preferredProductionIPv6	Production IPv6 preferred interface settings. The interface must be IPv6 and belong to this server. Valid values are: <ul style="list-style-type: none"> • <interface ID> • auto
-preferredBackupIPv4	Backup and DR test IPv4 preferred interface settings. The interface must be IPv4 and belong to this server. Valid values are: <ul style="list-style-type: none"> • <interface ID> • auto
-preferredBackupIPv6	Backup and DR test IPv6 preferred interface settings. The interface must be IPv6 and belong to this server. Valid values are: <ul style="list-style-type: none"> • <interface ID> • auto

Example 1

The following command updates NAS server nas_1 with these settings:

- Enables multiprotocol sharing.
- Uses LDAP as the Unix Directory Service.

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /net/nas/server -id nas_1 set -mpSharingEnabled yes -unixDirectoryService ldap
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection
```

```
ID = nas_1
Operation completed successfully.
```

Example 2

The following command changes the replication settings for NAS server nas_1.

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /net/nas/server -id nas_1 set -replDest yes
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection
```

```
ID = nas_1
Operation completed successfully.
```

Example 3

The following command changes the storage processor to SPB for NAS server nas_1.

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /net/nas/server -id nas_1 set -sp spb
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection
```

```
WARNING: Modifying the NAS server's SP disrupts any running NDMP jobs, and may also result in data unavailability for some client configurations other than NFS (v3, v4, and v4.1) and SMB3+CA. The NDMP jobs must be restarted after the SP modification is completed.
```

```
Are you sure you want to modify the default SP?
yes / no:yes

ID = nas_1
Operation completed successfully.
```

NOTE:


- When the SP is being modified, the NAS server health attribute is updated to INFO, and the health details attribute is updated to Transitioning to other Storage Processor. When the SP modification completes, the NAS server health and health details are reverted back to the previous values.
- A change to the SP cannot be performed on a NAS Server that is part of an active VDM File Import operation. The Import operation must be completed before the SP can be changed. Otherwise, the following error occurs: Failed: Cannot complete the operation because the resource is under import. (Error Code:0x900012a).
- A change to the SP cannot be performed on a NAS Server that is part of an active replication session. Pause the replication session, perform the SP change, and then resume the replication session. Otherwise, the following error occurs: Cannot modify the NAS server's Storage Processor when there are non-paused replication sessions on the NAS server or its file systems. (Error Code:0x6720665).

Delete NAS servers

Delete a NAS server.

Prerequisites

Before you can delete a NAS server, you must first delete all storage resources associated with it.

-  **NOTE:** Deleting a NAS server removes everything configured on the NAS server, but does not delete the storage resources that use it. You cannot delete a NAS server while it has any associated storage resources. After the storage resources are deleted, the files and folders inside them cannot be restored from snapshots. Back up the data from the storage resources before deleting them from the system.


Format


```
/net/nas/server {-id <value> | -name <value>} delete [{ -cifsDomUser <value> {-cifsDomPwd <value> | -cifsDomPwdSecure} | -skipUnjoin}]
```

Object qualifiers

Qualifier	Description
-id	Type the ID of the NAS server to delete.
-name	Type the name of the NAS server to delete.

Action qualifiers

Qualifier	Description
-cifsDomUser	Domain username.  NOTE: If the NAS server still has SMB (CIFS) servers joined to it, specify the SMB domain user to unjoin from AD before deleting the NAS server.
-cifsDomPwd	Domain user password.

Qualifier	Description
	 NOTE: Specify the user password when you want to unjoin the CIFS server from the AD domain before deleting it.
-cifsDomPwdSecure	Domain user password in secure mode. This prompts the user to input the password.
-skipUnjoin	Does not unjoin the SMB server from the AD domain before deleting it.

Example

The following command deletes NAS server nas_1:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /net/nas/server -id nas_1 delete
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

Operation completed successfully.
```

Check and update user mappings for multiprotocol NAS servers

A multiprotocol environment requires the following types of user mappings:

- A Windows user name that maps to a corresponding Unix user name
- A Unix user name that maps to a corresponding Windows user name which uses NFS to access a file system configured with a Windows access policy
- A Unix user name that is not mapped to a corresponding Windows user name which uses NFS to access a file system configured with a Unix or native access policy.

This command uses information from LDAP, NIS, or local files to parse all file systems associated with the NAS server and to update the SID/UID mapping in all nodes.

Format

```
/net/nas/server {-id <value> | -name <value>} update [-async] {-userMapping [-dryRun] | -confView}
```

Object qualifiers

Qualifier	Description
-id	Type the ID of the NAS server to update.
-name	Type the name of the NAS server to update.

Action qualifiers

Qualifier	Description
-async	Perform the operation asynchronously.
-userMapping	For all CIFS (SMB) file systems on the NAS server, update the UID/GID and generate a user mapping report. A new UID/GID will be obtained from a Unix Directory Service for the user name of the object owner. The user name will be resolved from Active Directory by the Windows SID.

Qualifier	Description
	<p>i NOTE: Quota management and correct multiprotocol file access require correct mappings between SIDs and UIDs/GIDs at the NAS server level. Because this operation can take a significant amount of time for large file systems, it is recommended to use the <code>-async</code> qualifier.</p>
<code>-dryRun</code>	<p>Generate a user mapping report for downloading. Once users access a file or folder on the NAS server from the SMB protocol, their SID to UID/GID mapping is stored in an internal mapping database. This operation parses the mapping database, and for each mapped user, queries the existing Unix Directory Service and Active Directory Domain Controller to report any inconsistencies between the UID/GID in the Unix Directory Service and the UID/GID stored in the database.</p> <p>It is recommended that you generate and review the user mapping report right before enabling multiprotocol. This enables you to ensure that your Unix Directory Service can return a UID/GID for every user whose mapping is inconsistent. Otherwise, after multiprotocol is enabled, users with inconsistent mappings may not be able to access files, because their permissions cannot be determined. Also, access to objects created by these users from SMB/CIFS cannot be granted, because the owners cannot be mapped to Unix.</p> <p>When the UID/GID mapping for all NAS server file systems are updated, the mapping report is re-generated automatically.</p> <p>i NOTE: Once a user successfully accesses any file or folder on the NAS server from Windows, the UID/GID in the mapping database for this user is updated. The UID/GID is also updated if the user is accessing a file from Unix for a file system with a Windows access policy.</p>
<code>-confView</code>	<p>Force an immediate refresh of the NAS server configuration snapshot. When the NAS server is acting as replication destination of synchronous replication session, its configuration snapshot is updated every 15 minutes by default.</p>

Example 1

The following command generates a user mapping report for NAS server `nas_1`.

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /net/nas/server -id nas_1 update -async -userMapping
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection
```

```
Job ID = 76
Job created successfully.
```

Example 2

The following command forces an immediate refresh of NAS server `nas_1` snapshot.

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /net/nas/server -id nas_1 update -confView
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection
```

```
ID = nas_1
Operation completed successfully.
```

Manage FTP settings

File Transfer Protocol (FTP) is a client/server protocol that operates over TCP/IP and allows file sharing across heterogeneous systems. Secure File Transfer Protocol (SFTP) protocol provides secure file transfer and manipulation functionality by using SSH.

You can configure a NAS server to share files using the FTP or SFTP protocol. Remote clients can be authenticated using a Unix or Windows user name. You can also have the FTP service to accept anonymous user authentication.


Table 30. FTP and SFTP attributes for a NAS server

Attribute	Description
NAS server	Associated NAS server identifier.
FTP enabled	Indicates whether the FTP protocol is enabled. Valid values are: <ul style="list-style-type: none">• yes• no (default)
SFTP enabled	Indicates whether the SFTP protocol is enabled. Valid values are: <ul style="list-style-type: none">• yes• no (default)
CIFS users enabled	Indicates whether Windows (SMB) users can be authenticated by the FTP or SFTP server. Valid values are: <ul style="list-style-type: none">• yes (default)• no
Unix users enabled	Indicates whether Unix users can be authenticated by the FTP or SFTP server. Valid values are: <ul style="list-style-type: none">• yes (default)• no
Anonymous user enabled	Indicates whether the FTP server supports anonymous user authentication. Valid values are: <ul style="list-style-type: none">• yes (default)• no
Home directory limitation enabled	Indicates whether authenticated FTP or SFTP users are limited to their home directories. Valid values are: <ul style="list-style-type: none">• yes (default)• no
Default home directory	Indicates the default home directory for the FTP or SFTP users with no defined or accessible home directory.
Welcome message	Indicates the welcome message that appears to FTP or SFTP users before authentication.
Message of the day	Indicates the message of the day that appears once the FTP or SFTP users log on.
Audit enabled	Indicates whether the FTP or SFTP server has audit file collection enabled. Valid values are: <ul style="list-style-type: none">• yes• no
Audit files directory	Specifies the directory where the audit files for the FTP or SFTP server are stored.
Audit file maximum size	Specifies the maximum file size of the audit files. When the maximum is reached, a new audit file is created.

Table 30. FTP and SFTP attributes for a NAS server (continued)

Attribute	Description
Allowed hosts	<p>Specifies a comma-separated list of host IPs that are allowed access to the FTP or SFTP server. The IP can be the IPv4, IPv6, or subnet address.</p> <p>For subnets, the following notation convention must be used:</p> <ul style="list-style-type: none"> 10.0.0.1/10 2000:DB1::/10 <p>Network names are ignored.</p> <p>NOTE: If this option is specified, FTP/SFTP connections are allowed only for clients whose IP addresses are included in those specified in the allowed hosts list. Any clients whose IP is not specified in this list are denied access. If a subnet is defined in the allowed hosts list, the client IP must belong to the specified subnet to be allowed to connect to the NAS server. If defined, denied hosts cannot be defined.</p>
Allowed users	<p>Specifies a comma-separated list of user names that are allowed access to the FTP or SFTP server (numerical user IDs are invalid and ignored).</p> <p>NOTE: If this option is specified, FTP/SFTP connections are allowed only for the specified users. Any users not specified in this list are denied access. If defined, denied users cannot be defined.</p>
Allowed groups	<p>Specifies a comma-separated list of user groups that are allowed access to the FTP or SFTP server. Specify the name of the group (numerical group IDs are invalid and ignored).</p> <p>NOTE: If this option is specified, FTP/SFTP connections are allowed only for the listed groups. Any user groups not specified in this list will be denied access. If defined, denied groups cannot be defined.</p>
Denied hosts	<p>Specifies a comma-separated list of host IPs that are denied access to the FTP or SFTP server. The IP can be the IPv4, IPv6, or subnet address.</p> <p>For subnets, the following notation convention must be used:</p> <ul style="list-style-type: none"> 10.0.0.1/10 2000:DB1::/10 <p>Network names are ignored.</p> <p>NOTE: If this option is specified, FTP/SFTP connections are denied only for clients whose IP addresses or subnet addresses are included in this list. If defined, allowed hosts cannot be defined.</p>
Denied users	<p>Specifies a comma-separated list of user names that are denied access to the FTP or SFTP server (numerical user IDs are invalid and ignored).</p> <p>NOTE: If this option is specified, FTP/SFTP connections are denied only for the specified users. Any users not specified in this list are allowed access. If defined, allowed users cannot be defined.</p>
Denied groups	<p>Specifies a comma-separated list of user groups that are denied access to the FTP or SFTP server. Specify the name of the group (numerical group IDs are invalid and ignored).</p>

Table 30. FTP and SFTP attributes for a NAS server (continued)

Attribute	Description
	 NOTE: If this option is specified, FTP/SFTP connections are denied only for the listed groups. Any user groups not specified in this list will be allowed access. If defined, allowed groups cannot be defined.

View FTP settings

View FTP or SFTP server settings for a NAS server.

Format

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

Object qualifier

Qualifier	Description
-server	Type the name of the associated NAS server.

Example

The following command displays the FTP server settings for a NAS server:

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

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

1:   NAS server           = nas_1
     FTP enabled         = yes
     SFTP enabled        = no
     CIFS users enabled   = yes
     Unix users enabled   = yes
     Anonymous user enabled = no
     Homedir limitation enabled = no
     Default home directory = /home/public
     Allowed hosts        = 1.2.3.10,1.2.3.11,192.168.0.0/16,2001:db8::/48
     Allowed users        =
     Allowed groups       =
     Denied hosts         =
     Denied users         = guest,jack,john
     Denied groups        = guests,group1
```

Change FTP settings

Modify existing FTP or SFTP settings of a NAS server.

Format

```
/net/nas/ftp -server <value> set [-ftpEnabled <value>] [-sftpEnabled <value>] [-cifsUserEnabled <value>] [-unixUserEnabled <value>] [-anonymousUserEnabled <value>] [-homedirLimitEnabled <value>] [-defaultHomedir <value>] [-welcome <value>] [-motd <value>] [-auditEnabled {yes|no}] [-auditDir <value>] [-auditMaxSize <value>] {[-allowHost <value>] | [-appendAllowHost <value>] | [-removeAllowHost <value>] | [-denyHost
```

```
<value>] | [-appendDenyHost <value>] | [-removeDenyHost <value>]] {[-allowUser <value>]
| [-appendAllowUser <value>] | [-removeAllowUser <value>] | [-denyUser <value>]
| [-appendDenyUser <value>] | [-removeDenyUser <value>]] {[-allowGroup <value>] | [-
appendAllowGroup <value>] | [-removeAllowGroup <value>] | [-denyGroup <value>] | [-
appendDenyGroup <value>] | [-removeDenyGroup <value>]]}
```



Object qualifier

Qualifier	Description
-server	Type the name of the NAS server.

Action qualifier

Qualifier	Description
-ftpEnabled	Indicates whether the FTP server is enabled on the NAS server. Valid values are: <ul style="list-style-type: none"> • yes • no
-sftpEnabled	Indicates whether the SFTP server is enabled on the NAS server. Valid values are: <ul style="list-style-type: none"> • yes • no
-cifsUserEnabled	Indicates whether Windows (SMB) users can be authenticated by the FTP or SFTP server. Valid values are: <ul style="list-style-type: none"> • yes • no
-unixUserEnabled	Indicates whether Unix users can be authenticated by the FTP or SFTP server. Valid values are: <ul style="list-style-type: none"> • yes • no
-anonymousUserEnabled	Indicates whether the FTP server supports anonymous user authentication. Valid values are: <ul style="list-style-type: none"> • yes • no
-homedirLimitEnabled	Indicates whether authenticated FTP or SFTP users are limited to their home directories. Valid values are: <ul style="list-style-type: none"> • yes • no
-defaultHomedir	Type the default home directory for the FTP or SFTP users with no defined or accessible home directory.
-welcome	Type the welcome message that appears to FTP or SFTP users before authentication.
-motd	Type the message of the day that appears once the FTP or SFTP users log on.
-auditEnabled	Indicates whether FTP/SFTP auditing is enabled on the NAS server. Valid values are: <ul style="list-style-type: none"> • yes • no
-auditDir	Type the directory where the audit files should be saved.
-auditMaxSize	Type the maximum size for the audit log file. When this maximum is exceeded, a new audit file is created.
-allowHost	Type the comma-separated list of allowed client host IPs. The IP can be the IPv4, IPv6, or subnet address. For subnets, the following notation convention must be used: <ul style="list-style-type: none"> • 10.0.0.1/10

Qualifier	Description
	<ul style="list-style-type: none"> 2000:DB1::/10 <p>Network names are ignored.</p> <p>i NOTE: If specified, FTP/SFTP connections are allowed only for clients whose IP addresses are included in those specified in the allowed hosts list. Any clients whose IP is not specified in this list are denied access. If a subnet is defined in the allowed hosts list, the client IP must belong to the specified subnet to be allowed to connect to the NAS FTP/SFTP server. If <code>-allowHost</code> is defined, <code>-denyHost</code> cannot be defined.</p>
<code>-appendAllowHost</code>	Specify one or multiple comma-separated host IPs to append to existing list of allowed host IP addresses.
<code>-removeAllowHost</code>	Specify one or multiple comma-separated host IPs to remove from the existing list of allowed host IP addresses.
<code>-denyHost</code>	<p>Type the comma-separated list of client host IPs that will be denied access to the FTP/SFTP server. The IP can be the IPv4, IPv6, or subnet address.</p> <p>For subnets, the following notation convention must be used:</p> <ul style="list-style-type: none"> 10.0.0.1/10 2000:DB1::/10 <p>Network names are ignored.</p> <p>i NOTE: If specified, FTP/SFTP connections are denied only for clients whose IP addresses are included in those specified in the <code>-denyHost</code> list. Any clients whose IP is not specified in this list are allowed access. If a subnet is defined in the denied hosts list, client IPs which belong to the specified subnet will be denied access to the NAS FTP/SFTP server. If <code>-denyHost</code> is defined, <code>-allowHost</code> cannot be defined.</p>
<code>-appendDenyHost</code>	Specify one or multiple comma-separated host IPs to append to existing list of denied host IP addresses.
<code>-removeDenyHost</code>	Specify one or multiple comma-separated host IPs to remove from the existing list of denied host IP addresses.
<code>-allowUser</code>	<p>Type the comma-separated list of user names that will be allowed access to the FTP/SFTP server (numerical user IDs are invalid and ignored).</p> <p>i NOTE: If this option is specified, FTP/SFTP connections are allowed only for the specified users. Any users not specified in this list are denied access. If <code>-allowUser</code> is defined, <code>-denyUser</code> cannot be defined.</p>
<code>-appendAllowUser</code>	Specify one or multiple comma-separated user names to append to existing list of allowed users.
<code>-removeAllowUser</code>	Specify one or multiple comma-separated user names to remove from the existing list of allowed users.
<code>-denyUser</code>	<p>Type the comma-separated list of user names that will be denied access to the FTP/SFTP server (numerical user IDs are invalid and ignored).</p> <p>i NOTE: If this option is specified, FTP/SFTP connections are denied only for the specified users. Any users not specified in this list are denied access. If <code>-denyUser</code> is defined, <code>-allowUser</code> cannot be defined.</p>
<code>-appendDenyUser</code>	Specify one or multiple comma-separated user names to append to existing list of denied users.
<code>-removeDenyUser</code>	Specify one or multiple comma-separated user names to remove from the existing list of denied users.
<code>-allowGroup</code>	Type the comma-separated list of user group names that will be allowed access to the FTP/SFTP server (numerical group IDs are invalid and ignored).

Qualifier	Description
	 NOTE: If this option is specified, FTP/SFTP connections are allowed only for the listed groups. Any user groups not specified in this list will be denied access. If <code>-allowGroup</code> is defined, <code>-denyGroup</code> cannot be defined.
<code>-appendAllowGroup</code>	Specify one or multiple comma-separated user group names to append to existing list of allowed groups.
<code>-removeAllowGroup</code>	Specify one or multiple comma-separated user group names to remove from the existing list of allowed groups.
<code>-denyGroup</code>	Type the comma-separated list of user group names that will be denied access to the FTP/SFTP server (numerical group IDs are invalid and ignored).  NOTE: If this option is specified, FTP/SFTP connections are denied only for the listed groups. Any user groups not specified in this list will be allowed access. If <code>-denyGroup</code> is defined, <code>-allowGroup</code> cannot be defined.
<code>-appendDenyGroup</code>	Specify one or multiple comma-separated user group names to append to existing list of denied groups.
<code>-removeDenyGroup</code>	Specify one or multiple comma-separated user group names to remove from the existing list of denied groups.

Example 1

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /net/nas/ftp -server nas_1
set -ftpEnabled yes -sftpEnabled no -cifsUserEnabled yes -unixUserEnabled yes -
anonymousUserEnabled no -homedirLimitEnabled no -defaultHomedir /home/public -welcome
"Welcome to this awesome server"
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

Operation completed successfully.
```

Example 2

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /net/nas/ftp -server nas_1 set -denyUser
"guest,jack,john" -appendAllowHost 1.2.3.4,1.2.3.5
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

Operation completed successfully.
```

Manage LDAP settings of a NAS server

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.

You can configure a NAS server to use LDAP or NIS as a Unix Directory Service to map users, retrieve netgroups, and build a Unix credential. When an initial LDAP configuration is applied, the system checks for the type of LDAP server. It can be an Active Directory schema (IDMU), IPLANET schema, or an RFC 2307 (open LDAP) schema. By default, the RFC 2307 schema is generated. Once the schema is identified, it is saved inside a `ldap.conf` file. You can download this LDAP schema, edit it based on your needs, and upload it back again using the CLI commands mentioned in this section.

The following table lists the attributes for LDAP settings for a NAS server.

Table 31. LDAP settings of a NAS server

Attribute	Description
NAS server	Unique identifier of the associated NAS server. The LDAP client configuration object is identified by the NAS server ID.
Servers	<p>Relevant IP addresses of the associated LDAP servers. If you want the NAS server to use DNS service discovery to obtain LDAP server IP addresses automatically, do not specify a value for this option.</p> <p>NOTE: For the automatic discovery process to work, the DNS server must contain pointers to the LDAP servers, and the LDAP servers must share the same authentication settings.</p>
Port	The TCP/IP port used by the NAS server to connect to the LDAP servers. Default value for LDAP is 389 and LDAPS is 636.
Protocol	<p>Type of LDAP protocol. Valid values are:</p> <ul style="list-style-type: none"> • ldap • ldaps <p>For a secure SSL connection, use ldaps.</p>
Authentication type	<p>Type of authentication for the LDAP server. Valid values are:</p> <ul style="list-style-type: none"> • anonymous • kerberos • simple
Verify certificate	<p>Indicates whether Certification Authority certificate is used to verify the LDAP server certificate for secure SSL connections. Valid values are:</p> <ul style="list-style-type: none"> • yes • no <p>Value shows as empty when the LDAP protocol is selected (no SSL). Value defaults to yes when the LDAPS protocol is used.</p>
Use CIFS account (applies to Kerberos authentication)	<p>Indicates whether CIFS authentication is used to authenticate to the LDAP server. Valid values are:</p> <ul style="list-style-type: none"> • yes – Indicates that the CIFS (SMB) settings are used for Kerberos authentication. This option is commonly used when configuring IDMU as a Unix directory service. • no – Indicates that Kerberos uses its own settings. See Configure Kerberos settings on page 135 to configure authentication through the Kerberos realm.
Principal (applies to Kerberos authentication)	Specifies the principal name for Kerberos authentication.
Realm (applies to Kerberos authentication)	Specifies the realm name for Kerberos authentication.
Password (applies to Kerberos authentication)	Specifies the associated password for Kerberos authentication.
Bind DN (applies to Simple authentication)	Specifies the Distinguished Name (DN) used when binding.
Bind password (applies to Simple authentication)	Specifies the associated password used when binding.
Base DN	Specifies the DN of the root level in the directory tree in RFC notation, or specifies the dotted domain name.
Profile DN	For an iPlanet LDAP server, specifies the DN of the entry with the configuration profile.
Replication sync	Indicates the status of the LDAP servers addresses list in the NAS server operating as a replication destination. When

Table 31. LDAP settings of a NAS server (continued)

Attribute	Description
	<p>a replicated LDAP servers list is created on the source NAS server, it is automatically synchronized to the destination. Valid values are:</p> <ul style="list-style-type: none"> • <code>Not replicated</code> – LDAP list is not replicated over to the destination. • <code>Auto synchronized</code> – LDAP list is automatically synchronized over to the replication destination. Any modify or delete operations at the source will automatically be reflected on the destination. • <code>Overridden</code> – LDAP list has been manually modified or overridden on the replication destination. Modifications or deletions of addresses from the LDAP list on the source NAS server will have no effect on the overridden DNS list on the replication destination. <p>NOTE: When a LDAP list is disabled or deleted from the source, overridden LDAP list in the destination may not get disabled or deleted automatically.</p>
Source servers	List of LDAP server IP addresses defined on the replication source.

View LDAP settings of a NAS server

View LDAP settings of a NAS server.

Format

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

Object qualifier

Qualifier	Description
-server	Name of the associated NAS server.

Example

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /net/nas/ldap -server nas_1 show -detail
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

1: NAS server      = nas_1
   IP address      = 10.64.74.64, 10.64.74.74
   Port           = 636
   Protocol       = ldaps
   Authentication  = simple
   Use CIFS account =
   Principal      =
   Realm          =
   Bind DN        = cn=administrator,cn=User,dc=emc,dc=com
   Base DN        = dc=emc,dc=com
   Profile DN     =
   Replication sync = Not replicated
   Source servers  =
```

Change LDAP settings of a NAS server

Modify LDAP settings of a NAS server.



Format

```
/net/nas/ldap -server <value> set {-enabled no | [ -ip <value>] [-port <value>] [-protocol {ldap | ldaps}] [-verifyCert {yes | no}] [-authType {anonymous | kerberos {-useCifsAccount | -principal <value> [-realm <value>] [{-password <value> | -passwordSecure }]} | simple [-bindDn <value> {-bindPasswd <value> | -bindPasswdSecure}]]] [-baseDn <value>] [-profileDn <value>]} [-replSync {auto | overridden}]
```

Object qualifier

Qualifier	Description
-server	Identifies the associated NAS server.

Action qualifier

Qualifier	Description
-enabled	Specify to disable LDAP for an existing NAS server. Valid value is no.  NOTE: Setting the value to no removes the LDAP settings for an existing NAS server.
-ip	Type the IP addresses (separated by comma) of the associated LDAP servers. If you want the NAS server to use DNS service discovery to obtain LDAP server IP addresses automatically, do not specify a value for this option.  NOTE: For the automatic discovery process to work, the DNS server must contain pointers to the LDAP servers, and the LDAP servers must share the same authentication settings.
-port	Type the port associated with the LDAP server. If LDAPS is used, the default is 363. If LDAP is used, the default port is 389.
-protocol	For a secure SSL connection, use ldaps.
-verifyCert	Specify that uploaded Certification Authority (CA) certificates should be used to verify the certificates of LDAP servers for establishing secure SSL connections. Valid values are: <ul style="list-style-type: none">• yes• no Applicable only when the protocol is LDAPS. Value shows as empty when LDAP (no SSL) is used.
-authType	Specify the type of authentication for the LDAP server. Valid values are: <ul style="list-style-type: none">• anonymous• kerberos• simple
-bindDn (valid only when simple authentication is used)	Type the Distinguished Name (DN) to be used when binding to the server.
-bindPasswd (valid only when simple authentication is used)	Type the associated password to be used when binding to the server.
-bindPasswdSecure (valid only when simple authentication is used)	Type the password in secured mode. You will be prompted to enter the password separately.

Qualifier	Description
<code>-useCifsAccount</code> (valid only when <code>kerberos</code> authentication is used)	Specify whether you want to use CIFS (SMB) authentication. For Kerberos authentication only. Commonly used to configure NAS servers to use IDMU as a Unix Directory Service. (Choose <code>simple</code> authentication to authenticate AD without using a CIFS account.)
<code>-principal</code> (valid only when <code>kerberos</code> authentication is used)	Type the principal name for Kerberos authentication.
<code>-realm</code> (valid only when <code>kerberos</code> authentication is used)	Type the realm name for Kerberos authentication.
<code>-password</code> (valid only when <code>kerberos</code> authentication is used)	Type the associated password for Kerberos authentication.
<code>-baseDn</code>	Type the DN of the root level in the directory tree in RFC notation, or type the dotted domain name. Valid notation formats include: <ul style="list-style-type: none"> • RFC, for example <code><dc=nt2k80,dc=drm,dc=lab,dc=emc,dc=com></code> • Dotted domain name, for example <code><nt2k80.drm.lab.emc.com></code>
<code>-profileDn</code>	For an iPlanet LDAP server, type the DN of the entry with the configuration profile.
<code>-replSync</code>	Status of the LDAP addresses servers list in the NAS server operating as a replication destination. Valid values are: <ul style="list-style-type: none"> • <code>auto</code> • <code>overridden</code>

Example

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /net/nas/ldap -server nas_1
set -ip 10.64.74.64,10.64.74.74 -port 636 -protocol ldaps -authType simple -bindDn
"cn=administrator,cn=User,dc=emc,dc=com" -bindPasswd "Ldap123!" -baseDn "dc=mec,dc=com"
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

Operation completed successfully.
```

Upload an LDAP schema

You can customize the LDAP schema for your NAS server, and upload the new schema file. Once the schema is uploaded, it gets validated. If the schema is valid, it is applied, and your NAS server LDAP configuration is changed.

Example

```
uemcli -upload -f "LDAP_nas_1.conf" -d 10.0.0.1 -u Local/joe -p MyPassword456! /net/nas/
ldap -server nas_1 -type config
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

Operation completed successfully.
```

Download an LDAP schema

When an initial LDAP configuration is applied, the system checks for the type of LDAP server. Once the schema is identified, the schema is saved inside an `ldap.conf` file. You can download this LDAP schema using the `-download` switch, and customize it based on your needs. For more information on switches, see [Switches](#) on page 18.

Example

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! -download /net/nas/ldap -server nas_1 -type config
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

Operation completed successfully.
```

Upload a Certification Authority certificate

You can upload Certification Authority (CA) certificates for your NAS LDAP servers. Once you upload the CA certificate, it can be used for validating certificates of an LDAP server.

Example

```
uemcli -upload -f "MyCert.pem" -d 10.0.0.1 -u Local/joe -p MyPassword456! /net/nas/ldap -server nas_1 -type CACertificate
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

Operation completed successfully.
```

Download a Certification Authority certificate

A Certification Authority (CA) certificate is used for validating certificates of an LDAP server.

Example

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! -download /net/nas/ldap -server nas_1 -type CACertificate
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

Operation completed successfully.
```

Manage NAS interfaces

NAS interfaces represent the network interface configured on an Ethernet port for a NAS server.

Table 32. Interface attributes

Attribute	Description
ID	ID of the interface.

Table 32. Interface attributes (continued)




Attribute	Description
NAS server	NAS server identifier.
Preferred	<p>Sets the network interface as the preferred source for outgoing traffic. All outgoing DNS or Active Directory requests are forwarded through this interface, and the IP address assigned to this interface is used as the source address of the data packets. For each NAS server, you can choose a single IP address as preferred. Valid values are:</p> <ul style="list-style-type: none"> • yes • no <p> NOTE: This attribute applies to file interfaces only.</p>
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	<p>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 1-4095.</p> <p>For IP multi-tenancy, the VLAN ID of a NAS server interface must comply with the set of VLAN IDs assigned to a tenant to which the NAS server belongs. Only unassigned VLAN IDs are allowed for NAS servers that do not belong to a tenant.</p> <p> NOTE: If no VLAN ID is specified, which is the default, packets do not have VLAN tags. The Unisphere online help provides more details about VLANs.</p>
IP address	IPv4 or IPv6 address.
Subnet mask	IPv4 subnet mask.
Gateway	IPv4 or IPv6 gateway.
MAC address	MAC address of the interface.
SP	SP that uses the interface.
Role	<p>Specifies the use of the file interface. Valid values are:</p> <ul style="list-style-type: none"> • production • backup <p>Backup interfaces are only available for backup via NFS and NDMP protocols, and are not available for CIFS (SMB) protocol. Interfaces associated with NAS servers in a replication session are not replicated via the replication session. You can create a backup interface on the destination NAS server. Unlike production interfaces, backup interfaces become instantly active on the destination NAS server and enable you to perform backup and disaster recovery testing via the NFS share over the snapshot.</p>
Replication sync	<p>Applies to production interfaces replicated over replication sessions. Valid values are:</p> <ul style="list-style-type: none"> • Not replicated • Auto synchronized – indicates that such interface is automatically synchronized over the replication session to the destination. Any modify and delete operations on the source will be automatically reflected on the destination. • Overridden – indicates that such interface is manually modified / overridden on the destination side. <p>When a replication production interface is created on the source NAS server, it is auto-synchronized to the destination.</p> <p> NOTE: Modifications or deletions of network settings of the corresponding source IP interfaces have no effect on overridden interface on destination. However, when an interface is deleted on the source, overridden interfaces stop responding and health state values of such interfaces become degraded/warning. This is because the SMB/CIFS shares are tightly set to the production IP interfaces, and they will not operate via overridden interfaces after a failover.</p>
Health state	<p>A numerical value indicating the health of the system. Valid values are:</p> <ul style="list-style-type: none"> • Unknown (0)

Table 32. Interface attributes (continued)

Attribute	Description
	<ul style="list-style-type: none"> • OK (5) • OK BUT (7) • Degraded/Warning (10) • Minor failure (15) • Major failure (20)
Health details	Additional health information.
Source VLAN ID	Indicates the value of the corresponding VLAN ID as defined on the source NAS server in a replication session.
Source IP address	Indicates the value of the corresponding IP address as defined on the source NAS server in a replication session.
Source subnet mask	Indicates the value of the corresponding subnet mask as defined on the source NAS server in a replication session.
Source gateway	Indicates the value of the corresponding gateway as defined on the source NAS server in a replication session.





Create a NAS interface





Create a NAS interface.

Format

```
/net/nas/if create [-vlanId <value>] {-server <value> | -serverName <value>} [-preferred]
-port <value> -addr <value>] [-netmask <value>] [-gateway <value>] [-role {production |
backup}]
```

Action qualifiers

Qualifier	Description
-server	<p>NAS server identifier.</p> <p> NOTE: A NAS server cannot have more than one IPv4 interface and one IPv6 interface.</p>
-serverName	<p>NAS server name.</p> <p> NOTE: A NAS server cannot have more than one IPv4 interface and one IPv6 interface.</p>
-preferred	<p>Specify this qualifier to set the network interface as the preferred source for outgoing traffic. That means that all outgoing DNS or Active Directory requests will be forwarded though interface marked as preferred and will use the IP address assigned to this interface as a source address of the packets.</p> <p> NOTE: For each NAS server, you can choose an IPv4 interface and IPv6 interface as the preferred interfaces.</p>
-port	<p>Type the ID of the SP port or link aggregation that will use the interface.</p> <p> NOTE: On dual SP systems, a file interface is created on a pair of symmetric Ethernet ports (or link aggregations) rather than on a single specified port. Its current port is defined by NAS server SP and may differ from the specified port (for example, if the user specifies spa_eth2, but the NAS server current SP is SP B, the interface is created on spb_eth2 instead).</p>
-vlanId	<p>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 1–4095.</p>

Qualifier	Description
	 NOTE: If no VLAN ID is specified, which is the default, packets do not have VLAN tags. The Unisphere online help provides more details about VLANs.
-addr	Type the IP address for the interface. The prefix length should be appended to the IPv6 address and, if omitted, will default to 64. For IPv4 addresses, the default length is 24. The IPv4 netmask may be specified in address attribute after slash.
-netmask	Type the subnet mask for the interface.  NOTE: This qualifier is not required if the prefix length is specified in the -addr attribute.
-gateway	Type the gateway for the interface.  NOTE: This qualifier configures the default gateway for the specified port's SP.
-role	Specify the role of the interface. Valid values are: <ul style="list-style-type: none"> • production (default) • backup  NOTE: To create an interface on a NAS server operating as a replication destination, specify the value as backup.

Example

The following command creates a NAS interface. The interface receives the ID IF_2:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /net/nas/if create -server nas_1 -port eth0_SPA -addr 10.0.0.1 -netmask 255.255.255.0
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

ID = IF_2
Operation completed successfully.
```

View NAS interfaces

View a list of NAS interfaces on the system. You can filter on the interface ID.

 **NOTE:** The [show action command](#) on page 21 explains how to change the output format.

Format

```
/net/nas/if [ {-id <value> | -port <value> | -server <value> | -serverName <value>} ] show
```

Object qualifiers

Qualifier	Description
-id	Type the ID of an interface.
-port	Type the port the interface is associated with.
-server	Type the NAS server the interface is associated with.
-serverName	Type the name of the NAS server the interface is associated with.

Example

The following command displays all NAS interfaces on the system:

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

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

1:      ID              = if_0
      NAS server        = nas_0
      Preferred         = yes
      Port              = eth0_spa
      VLAN ID           = 0
      IP address        = 3ffe:80c0:22c:4e:a:0:2:7f/64
      Subnet mask       =
      Gateway           = fe80::20a8bff:fe5a:967c
      SP                = SPA

2:      ID              = if_1
      NAS server        = nas_1
      Preferred         = yes
      Port              = eth1_spa
      VLAN ID           = 1
      IP address        = 192.168.1.2
      Subnet mask       = 255.255.255.0
      Gateway           = 192.168.1.254
      SP                = SPA

3:      ID              = if_2
      Type              = replication
      NAS server        =
      Preferred         = no
      Port              = eth1_spb
      VLAN ID           =
      IP address        = 10.103.75.56
      Subnet mask       = 255.255.248.0
      Gateway           = 10.103.72.1
      SP                = spb
```

Change NAS interface settings

Change the settings for a NAS interface.

Format





```
/net/nas/if -id <value> set [-vlanId <value>] [-addr <value>] [-netmask <value>] [-gateway <value>] [-preferred] [-replSync {auto | overridden}]
```

Object qualifier

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

Action qualifier

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 1–4095.

Qualifier	Description
	 NOTE: If no VLAN ID is specified, which is the default, packets do not have VLAN tags. The Unisphere online help provides more details on VLANs.
-addr	Specify the IP address for the interface.  NOTE: The prefix length should be appended to the IPv6 address. The IPv4 netmask may be specified in address attribute after the slash.
-netmask	Specify the IPv4 subnet mask for the interface.
-gateway	Specify the gateway for the interface.  NOTE: The gateway is optional for both IPv4 and IPv6. This qualifier configures the default gateway for the specified port's SP.
-preferred	Specify this qualifier to set the network interface as the preferred source for outgoing traffic. For each NAS server, you can choose an IPv4 interface and IPv6 interface as the preferred interfaces.  NOTE: This attribute applies to file interfaces only.
-replSync	Applicable only to NAS server acting as replication destination. Any modification to network address information automatically switches the interface into overridden mode. Valid values are: <ul style="list-style-type: none"> • auto • overridden Note the following: <ul style="list-style-type: none"> • Use this qualifier to switch an interface back into "auto" synchronization and clear all overridden settings. • When the corresponding interface is already deleted on the source, when replication sync is set to "auto", it will also cause deletion of the interface on destination. • Value "overridden" will cause network interfaces to stop being automatically synchronized. Current settings on the source system will become "frozen" and auto-propagation will stop.

Example

The following command changes the gateway address for interface IF_1:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456!/net/nas/if -id IF_1 set -gateway 2001:db8:0:170:a:0:2:70
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

ID = IF_1
Operation completed successfully.
```

Delete NAS interfaces

Delete a NAS interface.

 **CAUTION:** Deleting a NAS interface can break the connection between systems that use it, such as configured hosts.

Format

```
/net/nas/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/nas/if -id IF_1 delete
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection
```

```
Operation completed successfully.
```

Manage NAS routes

A NAS route represents a route configured on a NAS interface.

Table 33. NAS route attributes

Attribute	Description
ID	ID of the route.
NAS server	NAS server identifier.
Interface	ID of the interface used to reach the gateway.
Route type	Type of route. Valid values are (case-insensitive): <ul style="list-style-type: none">• default – The system uses a default gateway/route when it cannot find a more specific host or network route to a given destination. One default IPv4 and IPv6 route is allowed per interface.• host – Creates a route to a host.• net – Creates a route to a subnet.
Target	IP address for the target network node based on the value of -type. Value is one of the following: <ul style="list-style-type: none">• For a default route, the system will use the IP address specified for -gateway.• For a host route, specify the IP address of a target host.• For a net route, specify the IP address of a target subnet. Include the -netmask qualifier for the target subnet.
Netmask	Subnet mask.
Gateway	Gateway address.
Replication sync	If the route source is a NAS server production interface, this is a copy of the Replication sync attribute of the associated interface. (The associated interface is specified in the Interface attribute). If the route source is not a NAS server production interface, the value of this attribute is empty.
Health state	Numerical value indicating the health of the system. Valid values are: <ul style="list-style-type: none">• Unknown (0)• OK (5)• OK BUT (7)• Degraded/Warning (10)• Minor failure (15)• Major failure (20)
Health details	Additional health information.

Table 33. NAS route attributes (continued)

Attribute	Description
Use for external services access	Flag indicating whether the route is used for access to external services. Valid values are: <ul style="list-style-type: none"> • yes • no

Create a NAS route

Create a route for a NAS interface.

Format

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

Action qualifiers

Qualifier	Description
-if	Specify the interface associated with the route. Each interface has its own routing table for use in responding to inbound service requests.
-type	Specify the type of route. Valid values are (case-insensitive): <ul style="list-style-type: none"> • default – System uses the default route/gateway when a more specific host or network route is not available. One default IPv4 and IPv6 route is allowed per interface. • host – Create a route to a host. • net – Create a route to a subnet.
-target	Specify the IP address for the target network node based on the value of -type: <ul style="list-style-type: none"> • For a default route, do not specify a value. • For a host route, specify the IP address of a target host. • For a net route, specify the IP address of a target subnet. Include the -netmask qualifier for the target subnet.
-netmask	For a route to a subnet, specify the netmask of the destination subnet.
-gateway	Specify the gateway for the route.

Example

The following command creates a network route for interface if_1 to reach the 10.64.74.x subnet using gateway 10.64.74.1:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /net/nas/route create -if if_1 -type net -target 10.64.200.10 -netmask 255.255.255.0 -gateway 10.64.74.1
```

```
Storage system address: 10.64.75.201
Storage system port: 443
HTTPS connection
```

```
ID = route_1
Operation completed successfully.
```

Change NAS route settings

Change the settings for a NAS route.

Format

```
/net/nas/route -id <value> set [-type {default | host | net}] [-target <value>] [-netmask <value>] [-gateway <value>]
```

Object qualifier

Qualifier	Description
-id	Identifies the NAS route object.

Action qualifiers

Qualifier	Description
-type	Specify the type of route. Valid values are (case-insensitive): <ul style="list-style-type: none">• default – System uses the default route/gateway when a more specific host or network route is not available. One default IPv4 and IPv6 route is allowed per interface.• host – Create a route to a host.• net – Create a route to a subnet.
-target	Specify the IP address for the target network node based on the value of -type. Valid values are: <ul style="list-style-type: none">• For a default route, do not specify a value. The system will use the IP address specified for -gateway.• For a host route, specify the IP address of a target host.• For a net route, specify the IP address of a target subnet. Include the -netmask qualifier for the target subnet.
-netmask	For a route to a subnet, specify the netmask of the destination subnet.
-gateway	Specify the gateway for the route.

Example

The following command changes the target IP address to 10.64.200.11, the netmask to 255.255.255.0, and the gateway to 10.64.74.2 for NAS route route_1:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /net/nas/route -id route_1 set -target 10.64.200.11 -netmask 255.255.255.0 -gateway 10.64.74.2 uemcli
```

```
Storage system address: 10.64.75.201
Storage system port: 443
HTTPS connection
```

```
ID = route_1
Operation completed successfully.
```

View NAS routes

View a list of routes for a specified NAS interface or for all NAS interfaces on the system.

 **NOTE:** The `show action` command on page 21 explains how to change the output format.

Format

```
/net/nas/route [{-id <value> | -server <value> [-useForESAccess {yes | no}] | -if <value>}]
show
```

Object qualifiers

Qualifier	Description
-id	Specify the ID of the route.
-server	Specify the NAS server for which to view routes.
-useForESAccess	Indicate whether you want the system to display only the routes that are used for external services.
-if	Indicate whether you want the system to display only the routes associated with the specified NAS server.

Example

The following command displays all NAS routes on the system:

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

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

1:      ID                      = route_1
      NAS server                = nas_1
      Type                      = net
      Target                    = 10.50.50.10
      Netmask                   = 255.255.255.0
      Gateway                   = 10.0.0.1
      Interface                 = if_1
      Health state              = OK (5)
      Health details            = "The component is operating normally. action is
required."
      Replication sync          =
      Use for external services access = no

2:      ID                      = route_2
      NAS server                = nas_1
      Type                      = default
      Target                    =
      Netmask                   =
      Gateway                   = 10.0.0.2
      Interface                 = if_2
      Health state              = OK (5)
      Health details            = "The component is operating normally. No action
is required."
      Replication sync          =
      Use for external services access = no

3:      ID                      = route_3
      NAS server                = nas_1
      Type                      = host
      Target                    = 10.50.50.168
      Netmask                   =
      Gateway                   = 10.0.0.3
      Interface                 = if_3
      Health state              = OK (5)
      Health details            = "The component is operating normally. No action
is required."
      Replication sync          =
      Use for external services access = yes
```

Delete NAS routes

Delete a NAS route.

 **CAUTION:** Deleting a NAS route can break the connection between systems that use it, such as configured hosts.

Format

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

Object qualifier

Qualifier	Description
-id	Specify the ID of the interface to delete.

Example

The following command deletes route route_1:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /net/nas/route -id route_1 delete
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

Operation completed successfully.
```

Manage Kerberos settings

Settings for custom Kerberos key distribution center servers.

Kerberos is a distributed authentication service designed to provide strong authentication with secret-key cryptography. It works on the basis of "tickets" that allow nodes communicating over a non-secure network to prove their identity in a secure manner. When configured to act as a secure NFS server, the NAS server uses the RPCSEC_GSS security framework and Kerberos authentication protocol to verify users and services. You can configure a secure NFS environment for a multiprotocol NAS server or one that supports Unix-only shares. In this environment, user access to NFS file systems is granted based on Kerberos principal names.

Table 34. Kerberos attributes

Attribute	Description
NAS server	Kerberos realm configuration object, as identified by the NAS server ID.
Realm	Name of the Kerberos realm.
Servers	Comma separated list of DNS names for the Kerberos Key Distribution Center (KDC) servers.
Port	KDC servers TCP port. Default: 88.

Configure Kerberos settings

Set Kerberos settings for a NAS server.


Format

```
/net/nas/kerberos -server <value> set {-enabled no | [ -addr <value>] [-port <value>] [-realm <value>]}
```

Object qualifier

Qualifier	Description
-server	Identifies the associated NAS server.

Action qualifiers

Qualifier	Description
-enabled	Enables Kerberos on the NAS server. Value is yes or no.
-addr	Specifies the DNS names of the Kerberos KDC servers, separated by commas.  NOTE: Setting addresses via IP and overriding them is not supported in this release. A fully qualified DNS name is expected.
-port	Specifies the TCP port of the KDC server. Value is any TCP port.
-realm	Identifies the Kerberos realm. When non-unique for the system, the operation returns an error.

Example

The following command configures a custom Kerberos realm for NAS server nas_1:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /net/nas/kerberos -server nas_1 set -addr "master.mydomain.lab.emc.com,slave.mydomain.emc.com" -realm "MYDOMAIN.LAB.EMC.COM"
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

Operation completed successfully.
```

View Kerberos settings

View Kerberos settings.

Format

```
/net/nas/kerberos [{-server <value> | -realm <value>}] show
```

Object qualifiers

Qualifier	Description
-server	Identifies the associated NAS server.
-realm	Identifies the associated Kerberos realm.

Example

The following command shows Kerberos settings for all of the storage system's NAS servers.

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

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection
```



```
1:    NAS_server = nas_2
      Realm      = TEST.LAB.EMC.COM
      Servers    = us67890.test.lab.emc.com

2:    NAS_server = nas_1
      Realm      = TEST.LAB.EMC.COM
      Servers    = us12345.test.lab.emc.com
```

Manage VLANs

Network partitioning is provided through Virtual LANs. VLANs are statically allocated in the system, and the only allowed actions are to assign or de-assign a VLAN ID either to or from a specific tenant.

Each VLAN is identified by an ID.

The following table lists the attributes for VLANs.

Table 35. VLAN attributes

Attribute	Description
ID	VLAN identifier.
Tenant	Tenant identifier, if assigned.
Interface	List of network interfaces that use this VLAN ID for network traffic tagging.

View VLANs

View details about configured VLANs. You can filter on the ID of the VLAN.

Format

```
/net/vlan show {-id <value> | [-from <value>] [-count <value>] [-inUse {yes | no}] [-assigned {yes [-tenant <value>] | no}]}
```

Action qualifiers

Qualifier	Description
-id	Identifies the VLAN ID. Valid values are 1 to 4095. If specified, no other VLAN ID range, network interface or tenant assignment selectors are allowed.
-from	Specifies the lower boundary of the VLAN range to be displayed. Valid values are 1 to 4095. If omitted, the default value is 1.
-count	Specifies the number of items to be displayed. Valid values are 1 to 4095. If omitted, the default value is 10.
-inUse	Valid values are: <ul style="list-style-type: none">yes — Shows only those VLANs being used by a network interface. These VLANs cannot be moved to or from another tenant.no — Shows only those VLANs that are not being used by a network interface.
-assigned	Valid values are: <ul style="list-style-type: none">yes — Shows only those VLANs that are assigned to a tenant.no — Shows only those VLANs that are not assigned to a tenant.
-tenant	If specified, identifies the tenant.

Example

The following command displays information for VLANs that are in use starting from 100:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /net/vlan show -from 100 -inUse yes
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection
```

```
1:      VLAN      = 101
      Tenant      = tenant_1
      Interface   = if_1,if_3

2:      VLAN      = 105
      Tenant      =
      Interface   = if_5
```

Manage tenants

IP multi-tenancy provides the ability to assign multiple network namespaces to the NAS Servers on a storage processor. Tenants are used to create isolated file-based (CIFS/NFS) storage partitions. This enables cost-effective tenant management of available resources while ensuring that tenant visibility and management are restricted to assigned resources only.

Each tenant can have its own:

- VLAN domain
- Routing table
- IP firewall
- Virtual interface, traffic separated from virtual device and in Linux Kernel layer
- DNS server or other administrative servers to allow the tenant to have its own authentication and security validation from the Protocol layer

Each tenant is identified by a Universally Unique Identifier (UUID).

The following table lists the attributes for tenants.

Table 36. Tenant attributes

Attribute	Description
ID	Tenant identifier
Name	Friendly name of the tenant.
UUID	Universally unique identifier of a tenant.
VLAN	Comma-separated list of VLAN IDs assigned to the tenant.

Create a tenant

Create a tenant.

Format

```
/net/tenant create -name <value> -uuid <value> [-vlan <value>]
```

Action qualifiers

Qualifier	Description
-name	Specify the tenant name.

Qualifier	Description
-uuid	Specify the Universally Unique Identifier of a tenant.
-vlan	Specify the comma-separated list of VLAN IDs that the tenant can use. <div> <i>i</i> NOTE: Valid values are 1 to 4095; however, each specific VLAN ID can be assigned to a tenant if: <ol style="list-style-type: none"> 1. It is not assigned to any other tenant. 2. No existing network interfaces are tagged with the VLAN ID. </div>

Example

The following command creates a tenant with these settings:

- Tenant name is Tenant A.
- UUID is b67cedd7-2369-40c5-afc9-9e8753b88dee.

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /net/tenant create -name "Tenant A" -uuid b67cedd7-2369-40c5-afc9-9e8753b88dee
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection
```

```
ID = tenant_1
Operation completed successfully.
```

View tenants

View details about configured tenants. You can filter on the ID of the tenant.

Format

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

Object qualifier

Qualifier	Description
-id	Identifies the tenant to be displayed.

Example

The following command displays tenant information:

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

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection
```

```
1:      ID      = tenant_1
        Name    = Tenant A
        UUID    = b67cedd7-2369-40c5-afc9-9e8753b88dee
        VLAN    = 102,103,104
```

Change tenant settings

Change the settings for a tenant.

Format

```
/net/tenant -id <value> set [ -name <value> ] { [-vlan <value>] | [-addVlan <value>] | [-removeVlan <value>] }
```

Object qualifier

Qualifier	Description
-id	Identifies the tenant.

Action qualifiers

Qualifier	Description
-name	Specify the new name of the tenant.
-vlan	<p>Specify the comma-separated list of VLAN IDs.</p> <p>i NOTE: Valid values for VLAN IDs are 1 to 4095. The new set of VLAN IDs is compared against VLAN IDs already assigned to this tenant. Mismatches are interpreted as if respective IDs were passed to -addVlan or -removeVlan qualifiers. For example, if VLANs 101,102, and103 are assigned to tenant X, the command:</p> <pre>tenant -id X set -Vlan 101,102,104</pre> <p>is equivalent to:</p> <pre>tenant -id X set -removeVlan 103 tenant -id X set -addVlan 104</pre>
-addVlan	<p>Specify the VLAN ID to be assigned to the tenant.</p> <p>i NOTE: Valid values for VLAN IDs are 1 to 4095; however, each specific VLAN ID can be assigned to a tenant if:</p> <ol style="list-style-type: none">1. It is not assigned to any other tenant.2. No existing network interfaces are tagged with the VLAN ID.
-removeVlan	<p>Specify the VLAN ID to be removed from the tenant.</p> <p>i NOTE: The VLAN ID can be removed only if it is not in use by any interface of any NAS server within this tenant.</p>

Example

The following command changes the tenant settings for the list of VLAN IDs:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /net/tenant -id tenant_1 set -vlan 101,102,104
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

Operation completed successfully.
```

Delete a tenant

Deletes an existing tenant. When you delete an existing tenant, the VLANs associated with that tenant become available for use with other tenants.

Format

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

Object qualifiers

Qualifier	Description
-id	Identifies the tenant.

Example

The following command deletes a tenant.

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /net/tenant -id tenant_1 delete
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection
```

```
ID = tenant_1
Operation completed successfully.
```

Manage CIFS Servers

CIFS (SMB) servers use the CIFS protocol to transfer files. A CIFS server can participate as a member of a Windows Active Directory domain or operate independently of any Windows domain as a stand-alone CIFS server.

The following table lists the attributes for CIFS servers.

Table 37. CIFS Server attributes

Attribute	Description
ID	ID of the CIFS server.
NAS server	Associated NAS server ID.
Name	Name of the CIFS server account used when joining the Active Directory.
Description	Description of the CIFS server.
NetBIOS name	Server NetBIOS name.
Windows domain	Windows server domain name.
User name	Windows domain user name.
Password	Windows domain user password.
Last used organization unit	Last used Active Directory organizational unit.
Workgroup	Workgroup name.
Workgroup administrator password	Workgroup administrator password.

Create a CIFS server

Create a CIFS (SMB) server.

 **NOTE:** Only one CIFS server per NAS server can be created.

Format

```
/net/nas/cifs create {-server <value> | -serverName <value>} [-name <value>] [-description <value>] [-netbiosName <value>] {-domain <value> -username <value> {-passwd <value> | -passwdSecure} [-orgUnit <value>] | -workgroup <value> {-adminPasswd <value> | -adminPasswdSecure}}
```

Action qualifiers

Qualifier	Description
-server	Specifies the NAS server identifier.
-serverName	Specifies the NAS server name.
-name	Specifies the CIFS server name. By default, this is the same as the value for serverName. This value is ignored if the CIFS server is standalone.
-description	Specifies the description of the CIFS server.
-netbiosName	Specifies the CIFS server NetBIOS name. By default it is generated automatically based on the CIFS server name.
-domain (valid only when joining the CIFS server to AD)	Specifies Windows Active Directory domain name.
-username (valid only when joining the CIFS server to AD)	Specifies the Active Directory user that will be used to join the CIFS server to AD.
-passwd (valid only when joining the CIFS server to AD)	Specifies the AD user password.
-passwdSecure (valid only when joining the CIFS server to AD)	Specifies the password in secure mode. The user will be prompted to input the password and the password confirmation.
-orgUnit (valid only when joining the CIFS server to AD)	Active directory organizational unit.
-workgroup (valid only when configuring a stand-alone CIFS server)	Specifies the workgroup of the stand-alone -workgroup CIFS server.
-adminPasswd (valid only when configuring a stand-alone CIFS server)	Specifies the local administrator account password of the stand-alone CIFS server.
-adminPasswdSecure (valid only when configuring a stand-alone CIFS server)	Specifies the password in secure mode. You will be prompted to enter the password and the password confirmation.

Example

The following command creates a CIFS server.

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /net/nas/cifs create -server nas_0 -name CIFSserver1 -description "CIFS description" -domain domain.one.com -username user1 -passwd password1
```

```
Storage system address: 10.0.0.1
Storage system port: 443
```

```
HTTPS connection
```

```
ID = CIFS_0  
Operation completed successfully.
```

View CIFS server

The following command displays CIFS (SMB) server settings.

Format

```
/net/nas/cifs [{-id <value> | -name <value> | -server <value> | -serverName <value>}] show
```

Object qualifiers

Qualifier	Description
-id	Type the ID of the CIFS server.
-name	Type the name of the CIFS server.
-server	Type the ID of the associated NAS server.
-serverName	Type the name of the associated NAS server.

Example

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

```
Storage system address: 10.0.0.1  
Storage system port: 443  
HTTPS connection  
  
1:      ID           = CIFS_0  
      NAS server    = nas_0  
      Name          = CIFSserver1  
      Description   = CIFS description  
      NetBIOS name  = CIFSserv  
      Windows domain = domain.one.com
```

Change CIFS server settings

Modify an existing CIFS (SMB) server.

If moving a CIFS server from one domain to another, include the following options:

- [-domain <value>]
- [-newUsername <value> {-newPasswd <value> | -newPasswdSecure}]

Note that you must specify the username and password of the domain to which the CIFS server was previously joined in order to perform the unjoin. You must also specify the user name and password of the new domain to which it will be joined.

Format

```
/net/nas/cifs {-id <value> | -name <value>} set [-name <value>] [-description  
<value>] [-netbiosName <value>] [-currentUsername <value> {-currentPasswd <value> | -  
currentPasswdSecure} | -skipUnjoin} ] { [-domain <value>] [-newUsername <value> {-newPasswd  
<value> | -newPasswdSecure} ] | [-orgUnit <value>] | -workgroup <value>] [ {-adminPasswd  
<value> | -adminPasswdSecure} ] }
```

Object qualifiers

Qualifier	Description
-id	Type the ID of the CIFS server to change .
-name	Type the name of the CIFS server to change.

Action qualifiers

Qualifier	Description
-name	Specifies the new CIFS server name.
-description	Specifies the description of the CIFS server.
-netbiosName	Specifies the new CIFS server NetBIOS name.
-domain	Specifies the new Windows server domain name.
-orgUnit	Active Directory organizational unit.
-currentUsername	Specifies the current domain user.
-currentPasswd	Specifies the current domain user password.
-currentPasswdSecure	Specifies the current password in secure mode - the user will be prompted to input the password and the password confirmation.
-skipUnjoin	Do not unjoin the CIFS server from an AD domain.
-newUsername	Specifies the new domain user.
-newPasswd	Specifies the new domain user password.
-newPasswdSecure	Specifies the new password in secure mode - the user will be prompted to input the password and the password confirmation.
-workgroup	Specifies the new workgroup of the stand-alone CIFS server.
-adminPasswd	Specifies the new local admin password of the stand-alone CIFS server.
-adminPasswdSecure	Specifies the password in secure mode - the user will be prompted to input the password and the password confirmation.

Example

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /net/nas/cifs -id CIFS_0 set -workgroup MyWorkgroup -adminPasswd MyPassword
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

ID = CIFS_0
Operation completed successfully.
```

Delete a CIFS server

Delete an existing CIFS (SMB) server.

i NOTE: When you delete an existing CIFS server or convert it to a stand-alone configuration, you must specify the current credentials (username and password) to properly unjoin it from the domain and remove the computer account from Active Directory. You can use the `-skipUnjoin` option to delete the CIFS server without removing the computer account from

AD. (This will require the administrator to manually remove the account from AD.) The `-skipUnjoin` option can also be used when AD is not operational or cannot be reached. If you ran this command without the username and password, you will not be able to join the CIFS server with the same name back again. To join the same CIFS server back to the domain, you will then need to first change its name.



Format

```
/net/nas/cifs {-id <value> | -name <value>} delete [ {-username <value> {-passwd <value> |  
-passwdSecure} | -skipUnjoin} ]
```

Object qualifiers

Qualifier	Description
-id	Type the ID of the CIFS server to delete.
-name	Identifies the CIFS server name.

Action qualifiers

Qualifier	Description
-username	Specifies the domain username. Not required for stand-alone CIFS servers.  NOTE: Specify the username when you want to unjoin the CIFS server from the AD domain before deleting it.
-passwd	Specifies the domain user password. Not required for stand-alone CIFS servers.  NOTE: Specify the user password when you want to unjoin the CIFS server from the AD domain before deleting it.
-passwdSecure	Specifies the password in secure mode. This prompts the user to input the password.
-skipUnjoin	Does not unjoin the CIFS server from the AD domain before deleting it.

Example

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /net/nas/cifs -id CIFS_0 delete
```

```
Storage system address: 10.0.0.1  
Storage system port: 443  
HTTPS connection
```

```
ID = CIFS_0  
Operation completed successfully.
```

Manage NFS servers

NFS servers use the NFS protocol to transfer files.

The following table lists the attributes for NAS servers.

Table 38. NFS Server attributes


Attribute	Description
ID	ID of the NFS server.
NAS server	Associated NAS server ID.

Table 38. NFS Server attributes (continued)

Attribute	Description
Hostname	NFS server hostname. When an SMB server is joined to an Active Directory (AD) domain, the NFS server hostname is defaulted to the SMB computer name. If you configure NFS secure to use a custom realm for Kerberos authentication, this hostname can be customized.
NFSv3 enabled	Indicates whether NFS shares can be accessed by using the NFSv3 protocol. Valid values are <code>yes</code> or <code>no</code> (default is <code>yes</code>).
NFSv4 enabled	Indicates whether NFS shares can be accessed by using the NFSv4 protocol. Valid values are <code>yes</code> or <code>no</code> (default is <code>no</code>).
Secure NFS enabled	Indicates whether secure NFS (with Kerberos) is enabled. Value is <code>yes</code> or <code>no</code> .
Kerberos KDC type	Indicates the type of KDC realm to use for NFS secure. Value is one of the following: <ul style="list-style-type: none"> <code>Windows</code> — Use the Windows realm associated with the SMB server configured on the NAS server. If you configure secure NFS using this method, SMB support cannot be deleted from the NAS server while secure NFS is enabled and configured to use the Windows realm. <code>custom</code> — Configure a custom realm to point to any type of Kerberos realm. (Windows, MIT, Heimdal). If you configure secure NFS using this method, you must upload the keytab file to the NAS server being defined. Refer to Configure Kerberos settings on page 135 for more information.
Service principal name	Comma-separated list of service principal names to used to authenticate to the Kerberos realm. The name is automatically deducted from the NFS server hostname and the selected realm.
Extended Unix credentials enabled	Use more than 16 Unix groups. Value is <code>yes</code> or <code>no</code> (default).
Credentials cache retention	Credentials cache refreshing timeout, in minutes.

Create an NFS server

Create an NFS server.

 **NOTE:** Only one NFS server per NAS server can be created.

Format

```
/net/nas/nfs create {-server <value> | -serverName <value>} [-hostname <value>] [-v3 {yes | no}] [-v4 {yes | no}] [-secure {no | yes [-kdcType {Windows | custom}]]] [-username <value> {-passwd <value> | -passwdSecure}] [-extendedUnixCredEnabled {yes|no}] [-credCacheRetention <value>]
```

Action qualifiers

Qualifier	Description
<code>-server</code>	Specifies the NAS server identifier.
<code>-serverName</code>	Specifies the NAS server name.

Qualifier	Description
-hostname	Specifies the hostname for the NFS server. This is used in Kerberos and DNS registration, so that the client can specify this name when mounting exports. By default, the hostname is the same as the SMB computer name or NAS server name.
-v3	Indicates whether NFS shares can be accessed using the NFSv4 protocol. Value is yes (default) or no.
-v4	Indicates whether NFS shares can be accessed using the NFSv4 protocol. Value is yes or no (default).
-secure	Indicates whether to enable secure NFS (with Kerberos). Value is yes or no (default). To enable secure NFS, you must also configure the NAS server Kerberos object, specify a corresponding KDC type using the -kdcType qualifier, and upload the keytab file (generated with kadmin).
-kdcType	Specifies the type of type of KDC realm to use for NFS secure. Value is one of the following: <ul style="list-style-type: none"> • windows - Use the Windows realm associated with the SMB-enabled NAS server. If you configure secure NFS using this method, SMB support cannot be deleted from the NAS server while secure NFS is enabled and configured to use the Windows realm. • custom - Configure a custom realm to point to any type of Kerberos realm. (Windows, MIT, Heimdal). If you configure secure NFS using this method, you must upload the keytab file to the NAS server being defined. Refer to Configure Kerberos settings on page 135 for more information.
-username	(Applies when the -kdcType is Windows.) Specifies a user name with administrative rights to register the service principal in the AD domain.
-passwd	(Applies when the -kdcType is Windows.) Specifies the AD domain administrator password.
-passwdSecure	Specifies the password in secure mode. The user will be prompted to input the password and the password confirmation.
-extendedUnixCredEnabled	Specifies whether there are more than 16 Unix groups. Valid value is yes or no (default).
-credCacheRetention	Specifies the amount of time (in minutes) when the credential cache refreshes or times out. Default value is 15 minutes.

Example

The following command creates an NFS server on NAS server nas_1 with ID nfs_1 that supports NFSv4 and NFS secure.

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /net/nas/nfs create -server nas_1 -v4 yes -secure yes
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

ID = nfs_1
Operation completed successfully.
```

View an NFS server

The following command displays NFS server settings.

Format

```
/net/nas/nfs [{-id <value> | -server <value> | -serverName <value> | -hostname <value>}]
show
```

Object qualifiers

Qualifier	Description
-id	Type the ID of the NFS server to view.
-server	Type the ID of the associated NAS server.
-serverName	Type the name of the associated NAS server.
-hostname	Type the hostname for the NFS server. The FDQN or short name formats are supported.

Example

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

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

1:      ID                      = nfs_1
      NAS server                = nas_1
      Hostname                  = SATURN
      NFSv3 enabled             = yes
      NFSv4 enabled             = yes
      Secure NFS enabled        = yes
      Kerberos KDC type         = Windows
      Service principal name    = nfs/SATURN.domain.lab.emc.com, nfs/SATURN
      Extended Unix credentials enabled = no
      Credentials cache retention = 15
```

Change NFS server settings

Modify an existing NFS server.

Format

```
/net/nas/nfs [-id <value>] set [-hostname <value>] [-v3 {yes | no}] [-v4 {yes | no}] [-secure {no | yes [-kdcType {Windows | custom}]]] [-username <value> {-passwd <value> | -passwdSecure}] [-extendedUnixCredEnabled {yes | no}] [-credCacheRetention <value>]
```

Object qualifier

Qualifier	Description
-id	Identifies the NFS server to change.

Action qualifiers

Qualifier	Description
-hostname	Specifies the new hostname for the NFS server. This is used in Kerberos and DNS registration, so that the client can specify this name when mounting exports. By default, the hostname is the same as the SMB computer name or NAS server name
-v3	Indicates whether NFS shares can be accessed using the NFSv3 protocol. Valid values are yes or no.
-v4	Indicates whether NFS shares can be accessed using the NFSv4 protocol. Valid values are yes or no.

Qualifier	Description
-secure	Indicates whether to enable secure NFS (with Kerberos). Value is yes or no. To enable secure NFS, you must also configure the NAS server Kerberos object, specify a corresponding KDC type using the -kdcType qualifier, and upload the keytab file (generated with kadmin).
-kdcType	Specifies the type of type of KDC realm to use for NFS secure. Value is one of the following: <ul style="list-style-type: none"> • windows - Use the Windows realm associated with the SMB server configured on the NAS server. If you configure secure NFS using this method, SMB support cannot be deleted from the NAS server while secure NFS is enabled and configured to use the Windows realm. • custom - Configure a custom realm to point to any type of Kerberos realm (Windows, MIT, Heimdal). If you configure secure NFS using this method, you must upload the keytab file to the NAS server being defined. Refer to Configure Kerberos settings on page 135 for more information.
-username	(Applies when the -kdcType is Windows.) Specifies a user name with administrative rights to register the service principal in the AD domain.
-password	(Applies when the -kdcType is Windows.) Specifies the AD domain administrator password.
-passwdSecure	Specifies the password in secure mode. The user will be prompted to input the password and the password confirmation.
-skipUnjoin	(Applies when the KDC realm type is Windows.) Deletes the NFS server without automatically unregistering the NFS service principals from the AD domain.
-extendedUnixCredEnabled	Specifies whether there are more than 16 Unix groups. Valid values are yes or no.
-creditCacheRetention	Specifies the amount of time (in minutes) when the credential cache refreshes or times out. Default value is 15 minutes.

Example

The following command changes the credit cache retention period for NFS server nfs_1.

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /net/nas/nfs -id nfs_1 set -credCacheRetention 20
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

ID = nfs_1
Operation completed successfully.
```

Delete an NFS server

Delete an existing NFS server. The NFS server cannot be deleted if it has any associated resources, such as NFS shares, on the NAS server.

Format

```
/net/nas/nfs -id <value> delete [-username <value> {-passwd <value> | -passwdSecure}] [-skipUnjoin]
```

Object qualifier

Qualifier	Description
-id	Identifies the NFS server to delete.

Action qualifiers

Qualifier	Description
-username (applies when the KDC realm type is Windows)	Specifies a user name with administrative rights to unregister the service principal from the AD domain.
-passwd (applies when the KDC realm type is Windows)	Specifies the AD domain administrator password.
-passwdSecure	Specifies the password in secure mode. The user will be prompted to input the password and the password confirmation.
-skipUnjoin (applies when the KDC realm type is Windows)	Deletes the NFS server without automatically unregistering the NFS service principals from the AD domain.

Example

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /net/nas/nfs -id nfs_1 delete
```


```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection
```

```
Operation completed successfully.
```

Manage Common Anti Virus Agent (CAVA)

The following table lists the attributes for CAVA:

Table 39. CAVA attributes

Attribute	Description
NAS server	Associated NAS server identifier.
Enabled	Indicates if CAVA is enabled. Valid values are: <ul style="list-style-type: none">• yes• no <div> NOTE: Before you can enable CAVA, you must first upload a CAVA configuration file to the NAS server. See View the switches on page 27 for details on how to upload the configuration file.</div>

View CAVA settings

View details about CAVA settings.

Format

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

Object qualifier

Qualifier	Description
-server	Identifies the associated NAS server.

Example

The following command displays the CAVA settings:

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

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection
```

```
1:      NAS server  = nas_0
      Enabled      = yes

2:      NAS server  = nas_1
      Enabled      = no
```

Change CAVA settings

Modify the CAVA settings.


Format

```
/net/nas/cava -server <value> set -enabled {yes | no}
```

Object qualifier

Qualifier	Description
-server	Identifies the associated NAS server.

Action qualifier

Qualifier	Description
-enabled	<p>Specify whether CAVA is enabled. Valid values are:</p> <ul style="list-style-type: none">• yes• no <p> NOTE: Before you can enable CAVA, you must first upload a CAVA configuration file to the NAS server. See View the switches on page 27 for details on how to upload the configuration file.</p>

Example

The following command enables CAVA:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /net/nas/cava -server nas_1 set -enabled yes
```

```
Storage system address: 10.0.0.1
Storage system port: 443
```

HTTPS connection

Operation completed successfully.

Manage Events Publishing configuration settings

Events Publishing allows third-party applications to register to receive event notification and context from the storage system when accessing file systems by using the SMB or NFS protocols. The Common Event Publishing Agent (CEPA) delivers to the application both event notification and associated context in one message. Context may consist of file metadata or directory metadata that is needed to decide business policy.

You must define at least one event option (pre-, post-, or post-error event) when Events Publishing is enabled.

- Pre-event notifications are sent before processing an SMB or NFS client request.
- Post-event notifications are sent after a successful SMB or NFS client request.
- Post-error event notifications are sent after a failed SMB or NFS client request.

Table 40. Events Publishing attributes

Attributes	Description
NAS server	Identifies the associated NAS server.
Enabled	Identifies whether Events Publishing is enabled on the NAS Server. Valid values are: <ul style="list-style-type: none">• yes• no (default)
Pre-event failure policy	Policy applied when a pre-event notification fails. Valid values are: <ul style="list-style-type: none">• ignore (default) - indicates that when a pre-event notification fails, it is acknowledged as being successful.• deny - indicates that when a pre-event notification fails, the request of the SMB or NFS client is not executed by the storage system. The client receives a 'denied' response.
Post-event failure policy	Policy applied when a post-event notification fails. The policy is also applied to post-error events. Valid values are: <ul style="list-style-type: none">• ignore (default) - continue and tolerate lost events.• accumulate - continue and use a persistence file as a circular event buffer for lost events.• guarantee - continue and use a persistence file as a circular event buffer for lost events until the buffer is filled, and then deny access to file systems where Events Publishing is enabled.• deny - on CEPA connectivity failure, deny access to file systems where Events Publishing is enabled.
HTTP port	HTTP port number for connectivity to the CEPA server. The default value is 12228. The HTTP protocol is used to connect to CEPA servers. It is not protected by a username or password.
HTTP enabled	Identifies whether connecting to CEPA servers by using the HTTP protocol is enabled. When enabled, a connection by using HTTP is tried first. If HTTP is either disabled or the connection fails, then connection through the MS-RPC protocol is tried if all CEPA servers are defined by a fully-qualified domain name (FQDN). When an SMB server is defined in a NAS server in the Active Directory (AD) domain, the NAS server's SMB account is used to make an MS-RPC connection. Valid values are: <ul style="list-style-type: none">• yes (default)• no
Username	When using the MS-RPC protocol, name of a Windows user allowed to connect to CEPA servers.
Password	When using the MS-RPC protocol, password of the Windows user defined by the username.

Table 40. Events Publishing attributes (continued)

Attributes	Description
Heartbeat	Time interval (in seconds) between scanning CEPA servers to detect their online or offline status. The default is 10 seconds. The range is from 1 through 120 seconds.
Timeout	Time in ms to determine whether a CEPA server is offline. The default is 1,000 ms. The range is from 50 ms through 5,000 ms.
Health state	Health state of Events Publishing. The health state code appears in parentheses. Valid values are: <ul style="list-style-type: none">• OK (5) - the Events Publishing service is operating normally.• OK_BUT (7) - some CEPA servers configured for the NAS server cannot be reached.• Minor failure (15) - the Events Publishing service is not functional.• Major failure (20) - all CEPA servers configured for the NAS server cannot be reached.
Health details	Additional health information. See Appendix A, Reference, for details.

View CEPA configuration settings

View details about CEPA configuration settings.

Format

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

Object qualifier

Qualifier	Description
-server	Identifies the associated NAS server.

Example

The following example displays the CEPA settings.

```
uemcli /net/nas/event/config -server nas_1 show -detail
```

```
Storage system address: 10.1.2.100
Storage system port: 443
HTTPS connection

1:   NAS server           = nas_1
     Enabled             = yes
     Pre-event failure policy = ignore
     Post-event failure policy = ignore
     HTTP port           = 12228
     HTTP enabled         = yes
     Username             = user1
     Heartbeat            = 10s
     Timeout              = 1000ms
     Health state         = OK (5)
     Health details       = The Events Publishing Service is operating normally.
```

Change CEPA configuration settings

Modify the Events Publishing configuration. When you create a NAS server, an Events Publishing configuration object is automatically created with default values.


Format

```
/net/nas/event/config -server <value> set [-enabled {yes | no}] [-preEventPolicy {ignore | deny}] [-postEventPolicy {ignore | accumulate | guarantee | deny}] [-httpPort <value>] [-httpEnabled {yes | no}] [-username <value> {-passwd <value> | -passwdSecure}] [-heartbeat <value>] [-timeout <value>]
```

Object qualifier

Qualifier	Description
-server	Identifies the associated NAS server.

Action qualifiers

Qualifier	Description
-enabled	Identifies whether Events Publishing is enabled on the NAS Server. Valid values are: <ul style="list-style-type: none">• yes• no (default)
-preEventPolicy	Identifies the policy applied when a pre-event notification fails. Valid values are: <ul style="list-style-type: none">• ignore (default) - indicates that when a pre-event notification fails, it is acknowledged as being successful.• deny - indicates that when a pre-event notification fails, it is acknowledged with a 'denied' answer.
-postEventPolicy	Identifies the policy applied when a post-event notification fails. The policy is also applied to post-error events. Valid values are: <ul style="list-style-type: none">• ignore (default) - continue and tolerate lost events.• accumulate - continue and use a persistence file as a circular event buffer for lost events.• guarantee - continue and use a persistence file as a circular event buffer for lost events until the buffer is filled, and then deny access to file systems where Events Publishing is enabled.• deny - on CEPA connectivity failure, deny access to file systems where Events Publishing is enabled.
-httpPort	HTTP port number used for connectivity to the CEPA server. The default value is 12228. The HTTP protocol is used to connect to CEPA servers. It is not protected by a username or password.
-httpEnabled	Specifies whether connecting to CEPA servers by using the HTTP protocol is enabled. When enabled, a connection by using HTTP is tried first. If HTTP is either disabled or the connection fails, then connection through the MS-RPC protocol is tried if all CEPA servers are defined by a fully-qualified domain name (FQDN). The SMB account of the NAS server in the Active Directory domain is used to make the connection by using MS-RPC. Valid values are (case insensitive): <ul style="list-style-type: none">• yes (default)• no
-username	Name of a Windows user who is allowed to connect to CEPA servers.  NOTE: To ensure that a secure connection (by using the Microsoft RPC protocol) is used, you must disable HTTP by setting -httpEnabled=no.
-passwd	Password of the Windows user defined by the username.
-passwdSecure	Specifies the password in secure mode. The user is prompted to specify the password.
-heartbeat	Time interval between scanning CEPA servers (in seconds) to detect their online or offline status. The default is 10 seconds. The range is from 1 through 120 seconds.
-timeout	Time in ms to determine whether a CEPA server is offline. The default is 1,000 ms. The range is from 50 ms through 5,000 ms.

Example

The following command enables Events Publishing and sets the post-event policy to accumulate.

```
uemcli /net/nas/event/config -server nas_1 set -enabled yes -postEventPolicy accumulate
```

```
Storage system address: 10.1.2.100
Storage system port: 443
HTTPS connection
```

```
Operation completed successfully.
```

Manage CEPA pool configuration settings

Event pools configure the types of events published by the NAS Server, and the addresses of CEPA servers.

Events Publishing must be enabled for both the NAS server and the file system. Certain types of events can be enabled for either the NFS protocol, the SMB protocol, or both NFS and SMB on a file system basis.

Table 41. CEPA pool attributes

Attributes	Description
ID	Identifies the Events Publishing pool.
NAS server	Identifies the associated NAS server.
Name	Identifies the Events Publishing pool name.
Addresses	Addresses of the CEPA servers. A CEPA pool allows using IPv4, IPv6, and FQDN addresses.
Replication sync	<p>Applicable only when the NAS server is replicated through a replication session. Valid values are:</p> <ul style="list-style-type: none">• Not replicated• Auto synchronized – indicates that the Events Publishing pool servers list is automatically synchronized over the replication session to the destination. Any modify and delete operations on the source are automatically reflected on the destination.• Overridden – indicates that the Events Publishing pool servers list is manually modified or overridden on the destination side. <p>When an Events Publishing pool servers list is created on the source of a replication, it is auto-synchronized to the destination NAS server.</p> <p>IP address changes or deletions from the Events Publishing pool servers list on a source Events Publishing server have no effect on overridden Events Publishing pool servers on the destination.</p>
Source addresses	Addresses of the CEPA servers defined on the replication source. A CEPA pool allows using IPv4, IPv6, and FQDN addresses.
Pre-events	Lists the selected pre-events. The NAS server sends a request event notification to the CEPA server before an event occurs and processes the response. The valid events are defined in the table that follows.
Post-events	Lists the selected post-events. The NAS server sends a notification after an event occurs. The valid events are defined in the table that follows.
Post-error events	Lists the selected post-error events. The NAS server sends notification after an event generates an error. The valid events are defined in the table that follows.

Table 42. Event descriptions

Value	Definition	Protocol
OpenFileNoAccess	Sends a notification when a file is opened for a change other than read or write access (for example, read or write attributes on the file).	<ul style="list-style-type: none"> • SMB/CIFS • NFS (v4)
OpenFileRead	Sends a notification when a file is opened for read access.	<ul style="list-style-type: none"> • SMB/CIFS • NFS (v4)
OpenFileReadOffline	Sends a notification when an offline file is opened for read access.	<ul style="list-style-type: none"> • SMB/CIFS • NFS (v4)
OpenFileWrite	Sends a notification when a file is opened for write access.	<ul style="list-style-type: none"> • SMB/CIFS • NFS (v4)
OpenFileWriteOffline	Sends a notification when an offline file is opened for write access.	<ul style="list-style-type: none"> • SMB/CIFS • NFS (v4)
OpenDir	Sends a notification when a directory is opened.	SMB/CIFS
FileRead	Sends a notification when a file read is received over NFS.	NFS (v3/v4)
FileWrite	Sends a notification when a file write is received over NFS.	NFS (v3/v4)
CreateFile	Sends a notification when a file is created.	<ul style="list-style-type: none"> • SMB/CIFS • NFS (v3/v4)
CreateDir	Sends a notification when a directory is created.	<ul style="list-style-type: none"> • SMB/CIFS • NFS (v3/v4)
DeleteFile	Sends a notification when a file is deleted.	<ul style="list-style-type: none"> • SMB/CIFS • NFS (v3/v4)
DeleteDir	Sends a notification when a directory is deleted.	<ul style="list-style-type: none"> • SMB/CIFS • NFS (v3/v4)
CloseModified	Sends a notification when a file is changed before closing.	<ul style="list-style-type: none"> • SMB/CIFS • NFS (v4)
CloseUnmodified	Sends a notification when a file is not changed before closing.	<ul style="list-style-type: none"> • SMB/CIFS • NFS (v4)
CloseDir	Sends a notification when a directory is closed.	SMB/CIFS
RenameFile	Sends a notification when a file is renamed.	<ul style="list-style-type: none"> • SMB/CIFS • NFS (v3/v4)
RenameDir	Sends a notification when a directory is renamed.	<ul style="list-style-type: none"> • SMB/CIFS • NFS (v3/v4)
SetAclFile	Sends a notification when the security descriptor (ACL) on a file is changed.	SMB/CIFS
SetAclDir	Sends a notification when the security descriptor (ACL) on a directory is changed.	SMB/CIFS
SetSecFile	Sends a notification when a file security change is received over NFS.	NFS (v3/v4)
SetSecDir	Sends a notification when a directory security change is received over NFS.	NFS (v3/v4)

Create a CEPA pool

Create a CEPA pool.

Format

```
/net/nas/event/pool create -server <value> -name <value> -addr <value> [-preEvents <value>]  
[-postEvents <value>] [-postErrEvents <value>]
```

Action qualifiers

Qualifier	Description
-server	Identifies the associated NAS server.
-name	Specifies a CEPA pool name. The name must be unique for each NAS server.
-addr	Specifies a comma-separated list of addresses of the CEPA servers. You can specify IPv4, IPv6, and FQDN addresses.
-preEvents	Specifies the comma-separated list of pre-events.
-postEvents	Specifies the comma-separated list of post-events.
-postErrEvents	Specifies the comma-separated list of post-error events.

Example

The following command creates a CEPA pool and a list of post events for which to be notified.

```
uemcli /net/nas/event/pool create -server nas_1 -name mypool1 -addr 10.1.2.100 -postEvents  
CreateFile,DeleteFile
```

```
Storage system address: 10.1.2.100  
Storage system port: 443  
HTTPS connection
```

```
ID = cepa_pool_1  
Operation completed successfully.
```

View CEPA pool settings

View details about a CEPA pool.

Format

```
/net/nas/event/pool [{-id <value> | -server <value> | -name <value>}] show
```

Object qualifier

Qualifier	Description
-id	Identifies the Events Publishing pool.
-server	Identifies the associated NAS server.
-name	Identifies the Events Publishing pool name.

Example

The following command displays information about a CEPA pool.

```
uemcli /net/nas/event/pool -server nas_1 show
```

```
Storage system address: 10.1.2.100
Storage system port: 443
HTTPS connection

1:      ID                = cepa_pool_1
      NAS server          = nas_1
      Name                = MyCepaPool
      Addresses           = 10.1.2.2
      Pre-events          =
      Post-events         = CreateFile, DeleteFile
      Post-error events   =
```

Change CEPA pool settings

Modify settings for an existing Events Publishing pool.

Format

```
/net/nas/event/pool -id <value> set [-name <value>] [-addr <value>] [-preEvents <value>]
[-postEvents <value>] [-postErrEvents <value>] [-replSync {auto | overridden}]
```

Object qualifier

Qualifier	Description
-id	Identifies the Events Publishing pool.

Action qualifiers

Qualifier	Description
-name	Specifies a CEPA Pool name. The name is unique for any specified NAS server.
-addr	Specifies a comma-separated list of addresses of the CEPA servers. A CEPA pool allows IPv4, IPv6, and FQDN addresses.
-preEvents	Specifies the comma-separated list of pre-events.
-postEvents	Specifies the comma-separated list of post-events.
-postErrEvents	Specifies the comma separated list of post-error events.
-replSync	<p>Applicable only when the NAS server is operating as a replication destination. The valid values are:</p> <ul style="list-style-type: none">• auto – indicates that the Events Publishing pool servers list is automatically synchronized over the replication session to the destination. Any change and delete operations on the source are automatically reflected on the destination.• overridden – indicates that the Events Publishing pool servers list is manually changed or overridden on the destination side. <p>When a replicated Events Publishing pool servers list is created on the source Events Publishing server, it is auto-synchronized to the destination.</p> <p>Changes or deletions of IP addresses from the Events Publishing pool servers list on a source Events Publishing service have no effect on an overridden Events Publishing pool servers list on the destination.</p>

Example

The following command changes the name for a CEPA pool.

```
uemcli /net/nas/event/pool -id cepa_pool_1 set -name TestCepaPool
```

```
Storage system address: 10.1.2.100  
Storage system port: 443  
HTTPS connection
```

```
ID = cepa_pool_1  
Operation completed successfully.
```

Delete a CEPA pool

Deletes a CEPA pool.

Before you begin

The Events Publishing service requires at least one CEPA pool. If you delete the last CEPA pool, the Events Publishing service becomes disabled.

Format

```
/net/nas/event/pool [{-id <value> | -name <value>}] delete
```

Object qualifiers

Qualifier	Description
-id	Identifies the Events Publishing pool.
-name	Identifies the Events Publishing pool name.

Example

The following command deletes a CEPA pool.

```
uemcli /net/nas/event/pool -id cepa_pool_1 delete
```

```
Storage system address: 10.1.2.100  
Storage system port: 443  
HTTPS connection
```

```
Operation completed successfully.
```

Manage VMware NAS protocol endpoint servers

VMware protocol endpoint servers are NFS-based NAS servers enabled to provide an I/O path from the VMware host to its respective File VVol datastore on the storage system.


When creating a NAS protocol endpoint server, you can choose which IP address the NAS PE will use from the list of IP interfaces already created for the NAS server. It is recommended that you enable at least two NAS servers for VVols, one on each SP, for high availability. The system will select one of these NAS PEs automatically based on which will maximize throughput.

Table 43. Protocol endpoint server attributes

Attribute	Description
ID	VMware protocol endpoint identifier.
NAS server	Identifier of the associated NAS server for NAS PEs.

Table 43. Protocol endpoint server attributes (continued)

Attribute	Description
NAS server interface	Identifier of the NAS server IP interface to be used by the VMware NAS protocol endpoint server.

 **NOTE:** Only one VMware protocol endpoint server per NAS server is supported.

Create protocol endpoint servers

Create VMware protocol endpoints servers for File VVols.

Format

```
/net/nas/vmwarepe create [-async] {-server <value> | -serverName <value>} -if <value>
```

Action qualifier

Qualifier	Description
-async	Run the operation in asynchronous mode.
-server	Type the identifier of the NAS server.
-serverName	Type the name of the NAS server.
-if	Type the name of the identifier for the NAS IP interface to be used by the VMware protocol endpoint server.

Example

The following example creates a protocol endpoint server on NAS server "nas_1" with the IP interface "if_1".

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /net/nas/vmwarepe create -server nas_1 -if if_1
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

ID = PES_0
Operation completed successfully.
```

View VMware protocol endpoint servers

View VMware protocol endpoints servers for File VVols.

Format

```
/net/nas/vmwarepe [{-id <value> | -server <value> | -serverName <value>}] show
```

Action qualifier

Qualifier	Description
-id	Type the identifier of the NAS protocol endpoint server.

Qualifier	Description
-server	Type the identifier of the associated NAS server.
-serverName	Type the name of the associated NAS server.

Example

The following example shows the details for all of the VMware protocol endpoint servers on the system.

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

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

1:      ID                = PES_0
      NAS server          = nas_1
      NAS server interface = if_1
```

Delete protocol endpoint servers

Delete a VMware protocol endpoints server.

Format

```
/net/nas/vmwarepe -id <value> delete [-async] [-force]
```

Object qualifiers

Qualifier	Description
-id	Type the identifier or the VMware protocol endpoint server to be deleted.

Action qualifiers

Qualifier	Description
-async	Run the operation in asynchronous mode.
-force	Unconditionally removes all VMware NAS protocol endpoints using the VMware protocol endpoint server and unbinds all virtual volumes using the protocol endpoint server.

Example

The following example deletes VMware NAS protocol endpoint server "PES_0".

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /net/nas/vmwarepe -id PES_0 delete
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

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 243 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.

The iSCSI reverse CHAP object manages the username/secret used by the target (storage system) to respond to a challenge from an initiator (host).

Specify reverse CHAP secret settings

The following table lists the iSCSI reverse CHAP attributes.

Table 44. iSCSI reverse CHAP attributes

Attribute	Description
Username	The reverse CHAP user name.
Secret	The reverse CHAP secret (password).
Secret format	The reverse CHAP input format. Value is one of the following: <ul style="list-style-type: none">ascii - ASCII formathex - Hexadecimal format

Sets the reverse CHAP username and secret.

Format

```
/net/iscsi/reversechap set { [-username <value>] {-secret <value> | -secretSecure} [-secretFormat { ascii | hex } ] | -noChap}
```

Action qualifiers

Qualifier	Description
-username	The reverse CHAP user name.
-secret	Specifies the reverse CHAP secret (password). NOTE: Restrictions: the CHAP secret is an ASCII string that is 12 to 16 characters. Hexadecimal secrets are 12 to 16 pairs of data (24 to 32 characters).
-secretSecure	Specifies the password in secure mode - the user will be prompted to input the password.
-secretFormat	The reverse CHAP input format. Value is one of the following: <ul style="list-style-type: none">ascii - ASCII formathex - Hexadecimal format
-noChap	Remove the reverse CHAP credentials.

Example

```
uemcli /net/iscsi/reversechap set -secret xyz0123456789
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

Operation completed successfully.
```

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 21 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
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

1:      Username = ReverseChapUser
```

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. The following table lists the attributes for iSNS server records.

Table 45. 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/iscsi/isns create -server <value>
```

Action qualifiers

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/iscsi/isns create -server 10.5.2.128
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection
```

```
ID = isns_0
Operation completed successfully.
```

View iSNS server records

View details for configured iSNS server records.

 **NOTE:** The `show` action command on page 21 explains how to change the output format.

Format

```
/net/iscsi/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/iscsi/isns show
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection
```

```
ID = isns_0
Operation completed successfully.
```

Delete iSNS server records

Delete an iSNS server record.

Format

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

Object qualifier

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

Example

The following command deletes the iSNS server record isns_0:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /net/iscsi/isns -id isns_0 delete
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

Operation completed successfully.
```

Change iSNS server record settings

Modify an existing iSNS server record.

Format

```
/net/iscsi/isns -id <value> set -server <value>
```

Object qualifier

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

Action qualifiers

Qualifier	Description
-server	New IP address associated with the iSNS server.

Example

The following command modifies the iSNS server record:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /net/iscsi/isns -id isns_0 set -server 10.5.2.130
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

ID = isns_0
Operation completed successfully.
```

Manage iSCSI configuration

The following table lists the attributes for iSCSI configuration.

Table 46. iSCSI configuration attributes

Attribute	Description
CHAP required	Specifies whether CHAP authentication is required in order to access iSCSI storage. Valid values are: <ul style="list-style-type: none">yes

Table 46. iSCSI configuration attributes

Attribute	Description
	<ul style="list-style-type: none">no

View iSCSI configuration

View details about the iSCSI configuration.

Format

```
/net/iscsi/config show
```

Example

The following command shows details for the iSCSI configuration:

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

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

1: CHAP required = yes
```

Change iSCSI configuration

Modify the iSCSI configuration.

Format

```
/net/iscsi/config set -chapRequired {yes | no}
```

Object qualifier

Qualifier	Description
-chapRequired	Specify whether CHAP authentication is required. Values are case-sensitive. Valid values are: <ul style="list-style-type: none">yesno

Example

The following command denies host access without CHAP authentication:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /net/iscsi/config set -chapRequired yes
```

```
Storage system address:10.0.0.1
Storage system port: 443
HTTPS connection

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. iSCSI nodes run on each Ethernet port and communicate with network hosts through the SP ports.

iSCSI nodes handle storage creation, monitoring, and management tasks for iSCSI LUNs. Hosts connect to the LUN through iSCSI initiators.

Each iSCSI node is identified by an ID.

[Manage reverse CHAP for mutual CHAP authentication](#) on page 162 explains how to configure reverse CHAP authentication between iSCSI hosts and nodes.

The following table lists the attributes for iSCSI nodes.

Table 47. 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. 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: <code>iqn.1992-07.com.emc:apm000650039080000-3</code>
SP	Primary SP on which the node runs..
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">Unknown (0) — Status is unknown.OK (5) — Working correctly.Degraded/Warning (10) — Working and performing all functions, but the performance may not be optimum.Critical failure (25) — Failed and recovery may not be possible. This condition has resulted in data loss and should be remedied immediately.
Health details	Additional health information. See Appendix A, Reference, for health information details.
Port	Associated network port identifier.
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. NOTE: Manage network interfaces on page 178 explains how to configure network interfaces on the system.

View iSCSI nodes

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

NOTE: The `show action command` on page 21 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
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

1:      ID           = ISCSIN_1
      Alias          = MyISCSIServer1
      IQN            = iqn.1992-05.com.emc:fcnch0821001340000-1
      Health state   = OK (5)
      SP             = SPA
      Port           = eth0_SPA
      Interfaces     = IF_1,IF_2

2:      ID           = ISCSIN_2
      Name           = MyISCSIServer2
      IQN            = iqn.1992-05.com.emc:fcnch0821001340001-1
      Health state   = OK (5)
      SP             = SPA
      Port           = eth1_SPA
      Interfaces     = IF_3
```

Change iSCSI node settings

Change the network interface alias assigned to the node.

Format

```
/net/iscsi/node -id <value> set -alias <value>
```

Object qualifier

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

Action qualifier

Qualifier	Description
-alias	User-friendly name that identifies the iSCSI node.

Example

The following command assigns an alias to the ISCSIN_1 node:


```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /net/iscsi/node -id ISCSIN_1 set -alias "My iSCSI node"
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection
```

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

Manage Ethernet ports

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

The following table describes the port attributes.

Table 48. Network port attributes


Attribute	Description
ID	ID of the port.
Name	Name of the port.
SP	Name of the SP on which the port resides. Value is SPA or SPB.
Protocols	Types of protocols the port supports. Value is one of the following: <ul style="list-style-type: none"> • <code>mgmt</code> — Management interface. • <code>file</code> — Network interface for Windows (SMB) and Linux/UNIX (NFS) storage. • <code>iscsi</code> — iSCSI interface for iSCSI storage. Manage network interfaces on page 178 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.
Requested MTU size	MTU size set by the user.
Available MTU size	List of available MTU sizes. <div>  NOTE: This can display as either a comma-separated list of exact values (if there is an iSCSI interface on the port), or an interval defined by the minimum or maximum values, such as 1280-9216. </div>
Speed	Current link speed of the port.
Requested speed	Link speed set by the user.
Available speeds	List of available speed values.
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"> • <code>Unknown (0)</code> — Status is unknown. • <code>OK (5)</code> — Port is operating normally. • <code>OK BUT (7)</code> — Lost communication, but the port is not in use. • <code>Minor failure (15)</code> — Lost communication. Check the network connection and connected cables. • <code>Major failure (20)</code> — Port has failed. Replace the SP that contains the port.
Health details	Additional health information. See Appendix A, Reference, for health information details.
Aggregated port ID	If the port is in a link aggregation, the ID of the link aggregation appears. Manage link aggregations on page 187 explains how to configure link aggregations on the SP ports.
Connector type	Physical connector type. Valid values are: <ul style="list-style-type: none"> • <code>unknown</code>

Table 48. Network port attributes (continued)

Attribute	Description
	<ul style="list-style-type: none">• RJ45• LC• MiniSAS_HD• CopperPigtail• NoSeparableConnector
MAC address	Unique identifier assigned to a network device for communications on a network segment.
SFP supported speeds	List of supported speed values of the inserted Small Form-factor Pluggable.
SFP supported protocols	List of supported protocols of the inserted Small Form-factor Pluggable. Valid values are: <ul style="list-style-type: none">• unknown• FibreChannel• Ethernet• SAS

View Ethernet port settings

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

 **NOTE:** The `show action command` on page 21 explains how to change the output format.

Format

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

Object qualifier

Qualifier	Description
-id	Type the ID of the port.

Example

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

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

1:   ID           = spa_eth2
     Name        = SP A Ethernet Port 2
     SP         = spa
     Protocols   = file, net, iscsi
     MTU size    = 4500
     Requested MTU size = 4500
     Available MTU sizes = 1280-9216
     Linux device name = eth2
     Speed       = 1 Gbps
     Requested speed = auto
     Available speeds = 1 Gbps, 10 Gbps, 100 Mbps, auto
     Health state  = OK (5)
     Health details = "The port is operating normally."
     Aggregated port ID = None
     FSN port ID   = None
     Connector type = RJ45
     MAC address  = 00:60:16:7A:7F:CF
```


```

SFP supported speeds      =
SFP supported protocols =

2:  ID                      = spa_eth3
    Name                    = SP A Ethernet Port 3
    SP                     = spa
    Protocols               = file, net, iscsi
    MTU size                = 1500
    Requested MTU size     = 1500
    Available MTU sizes    = 1500, 9000
    Linux device name      = eth3
    Speed                  = 1 Gbps
    Requested speed        = auto
    Available speeds       = 1 Gbps, 10 Gbps, 100 Mbps, auto
    Health state           = OK (5)
    Health details         = "The port is operating normally."
    Aggregated port ID    = None
    FSN port ID            = None
    Connector type         = RJ45
    MAC address            = 00:60:16:7A:7F:CE
    SFP supported speeds   =
    SFP supported protocols =

```

Change Ethernet port settings

 **NOTE:** The new settings are applied to a pair of symmetrical ports on dual SP systems.

Change the maximum transmission unit size and port speed for an Ethernet port.

Format

```
/net/port/eth -id <value> set [-mtuSize <value>] [-speed <value>]
```

Object qualifier

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

Action qualifier

Qualifier	Description
-mtuSize	Type the maximum transmission unit packet size (in bytes) for the port: <ul style="list-style-type: none"> If an Ethernet port carries File interfaces only, the MTU size can be set to a custom value between 1280 and 9216. If an Ethernet port carries iSCSI interfaces, the allowed MTU sizes are 1500 and 9000. Specific I/O modules may also restrict allowed range for MTU size value. The MTU size values of 1500 bytes (default) and 9000 bytes (jumbo frame) are supported by all interfaces and I/O modules.
-speed	Type the port speed.

Example

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

```
uemcli /net/port/eth -id spa_eth0 set -mtuSize 9000
```

```

Storage system address: 10.0.0.1
Storage system port: 443

```

```
HTTPS connection
```

```
ID = spa_eth0  
ID = spb_eth0  
Operation completed successfully.
```

Manage SAS ports (physical deployments only)

View the settings for the SAS ports on each SP. The following table describes the port attributes.

Table 49. SAS port attributes

Attribute	Description
ID	ID of the port.
Name	Name of the port.
SP	Name of the SP on which the port resides. Valid values are: <ul style="list-style-type: none">• spa• spb
Speed	Current link speed of the port.
Health state	Health state of the port. The health state code appears in parentheses. Valid values are: <ul style="list-style-type: none">• Unknown (0) — Status is unknown.• OK (5) — Port is operating normally.• OK BUT (7) — Lost communication, but the port is not in use.• Minor failure (15) — Lost communication. Check the network connection and connected cables.• Major failure (20) — Port has failed. Replace the SP that contains the port.
Health details	Additional health information. See Health details on page 570 for health information details.
Connector type	Physical connector type. Valid values are: <ul style="list-style-type: none">• unknown• RJ45• LC• MiniSAS_HD• CopperPigtail• NoSeparableConnector

View SAS settings

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

 **NOTE:** The [show action command](#) on page 21 explains how to change the output format.

Format

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

Object qualifier

Qualifier	Description
-id	Type the ID of the port.

Example

```
uemcli /net/port/sas show
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

1:      ID          = spa_sas0
      Name          = SP A SAS Port 0
      SP            = spa
      Speed         = 
      Health state  = OK_BUT (7)

2:      ID          = spa_sas1
      Name          = SP A SAS Port 1
      SP            = spa
      Speed         = 6 Gbps
      Health state  = OK (5)
```

Manage FC ports

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

The following table describes the port attributes.

Table 50. FC port attributes

Attribute	Description
ID	ID of the port.
Name	Name of the port.
SP	Name of the SP on which the port resides.
WWN	World Wide Name (WWN) of the port.
Speed	Current link speed of the port.
Requested speed	Link speed set by the user.
Available speed	List of available speed values.
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">Unknown (0) — Status is unknown.OK (5) — Port is operating normally.OK BUT (7) — Lost communication, but the port is not in use.Minor failure (15) — Lost communication. Check the network connection and connected cables.Major failure (20) — Port has failed. Replace the SP that contains the port.
Health details	Additional health information. See Appendix A, Reference, for health information details.
Connector type	Physical connector type. Valid values are: <ul style="list-style-type: none">unknownRJ45LCMiniSAS_HDCopperPigtailNoSeparableConnector
SFP supported speeds	List of supported speed values of the inserted Small Form-factor Pluggable.
SFP supported protocols	List of supported protocols of the inserted Small Form-factor Pluggable. Valid values are:

Table 50. FC port attributes (continued)

Attribute	Description
	<ul style="list-style-type: none">• unknown• FibreChannel• Ethernet• SAS
Replication capability	Type of replication capability. Valid values are: <ul style="list-style-type: none">• Sync replication• RecoverPoint

View FC port settings

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

Format

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

Object qualifier

Qualifier	Description
-id	Type the ID of the port.

Example

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

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

1:      ID              = spa_fc4
      Name              = SP A FC Port 4
      SP                = spa
      WWN               = 50:06:BD:01:60:05:8E:50:06:01:64:3D:E0:05:8E
      Speed             = 1 Gbps
      Requested speed   = auto
      Available speeds   = 4 Gbps, 8 Gbps, 16 Gbps, auto
      Health state      = OK (5)
      Health details     = "The port is operating normally."
      SFP supported speeds = 4 Gbps, 8 Gbps, 16 Gbps
      SFP supported protocols = FibreChannel
      Replication capability = Sync replication
      SFP supported mode  = Multimode
```

Change port settings

Change the speed for an FC port.

Format

```
/net/port/fc -id <value> set -speed <value>
```

Object qualifier

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

Action qualifier

Qualifier	Description
-speed	Type the port speed.

Example

The following command sets the speed for FC port fc1 on SP A to 1 Gbps:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /net/port/fc -id spa_fc1 set -speed 1Gbps
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection
```

```
ID = spa_fc1
Operation completed successfully.
```

Manage uncommitted ports

This command is used to manage uncommitted network ports.

Uncommitted ports must be initialized in order to be used by the system. Use the CLI to view information on the uncommitted and removed system Small Form-factor Pluggable (SFP) ports.

Table 51. Uncommitted port attributes

Attribute	Description
ID	Port identifier.
Name	Port name.
SP	Storage processor on which the port resides.
Health state	Current health state of the port. Valid states are: <ul style="list-style-type: none">Unknown (0) — Status is unknown.OK (5) —The Uncommitted port is uninitialized. It needs to be committed before it can be used.OK (5) —The Small Form-factor Pluggable (SFP) module in this Uncommitted port has been removed. Since the port is not in use, no action is required.
Health details	Additional health information.
Connector type	Physical connector type associated with the uncommitted port. Valid values are: <ul style="list-style-type: none">unknownRJ45LCMiniSAS_HDCopperPigtailNoSeparableConnector
SFP supported speeds	List of supported speed values of the inserted SFP.

Table 51. Uncommitted port attributes (continued)

Attribute	Description
SFP supported protocols	List of supported protocols of the inserted SFP. Valid values are: <ul style="list-style-type: none">• unknown• FibreChannel• Ethernet

View uncommitted ports

Use this command to view a list of uncommitted ports on the system.

View details about uncommitted ports.

Format

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

Object qualifier

Qualifier	Description
-id	Type the ID of the port.

Example

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

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

1:      ID                      = spb_unc5
      Name                     = SP B Uncommitted Port 5
      SP                       = spb
      Health state             = OK (5)
      Health details           = "The Small Form-factor Pluggable (SFP) module in this
Uncommitted port has been removed. Since the port is not in use, no action is required."
      Connector type           = LC
      SFP supported speeds     =
      SFP supported protocols =

2:      ID                      = spa_unc5
      Name                     = SP A Uncommitted Port 5
      SP                       = spa
      Health state             = OK (5)
      Health details           = "The Uncommitted port is uninitialized. It needs to be
committed before it can be used."
      Connector type           = LC
      SFP supported speeds     = 10 Gbps
      SFP supported protocols = Ethernet

3:      ID                      = spb_iom_1_unc0
      Name                     = SP B I/O Module 1 Uncommitted Port 0
      SP                       = spb
      Health state             = OK (5)
      Health details           = "The Uncommitted port is uninitialized. It needs to be
committed before it can be used."
      Connector type           = RJ45
      SFP supported speeds     =
      SFP supported protocols =
```


Manage Management network interfaces

Configure management network interfaces to remotely manage and monitor the system, the network, and configured hosts. Specify the IP address for the interface as well as the IP addresses for the subnet mask and gateway. View details about existing management interfaces configured on the system through the Connection Utility. Each management interface is identified by its IP protocol version. IPv4 and IPv6 can be configured, independently of each other, at the same time, but they cannot both be disabled at the same time. The netmask can be specified with the appropriate prefix length, separated from the IP address with a /, such as 10.0.0.1/24. This is optional for IPv4, but required for IPv6. There can be up to five IPv6 addresses assigned automatically. Only one IPv6 address can be set manually.

The following table lists the interface attributes with a description of each.

Table 52. Interface attributes

Attribute	Description
IP protocol version	IP protocol version. Valid values are: <ul style="list-style-type: none">• ipv4• ipv6
Address origin	IP settings origin. Valid values are: <ul style="list-style-type: none">• disabled— Indicates the interface is disabled.• automatic— Indicates the IP attributes are set automatically by DHCP or SLAAC (IPv6 only).• static— Indicates the IP attributes are set manually.
IP address	IPv4 or IPv6 address.
Subnet mask	IPv4 subnet mask.
Gateway	IPv4 or IPv6 gateway.
MAC address	MAC address associated with the interface.

View management interfaces

View a list of interfaces on the system. You can filter on the interface ID.

Format

```
/net/if/mgmt show
```

Example

The following command displays all management interfaces on the system:

```
uemcli /net/if/mgmt show
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

1:      IP protocol version = ipv4
        Address origin      = static
        IP address          = 10.0.0.1
        Subnet mask         = 255.255.255.0
        Gateway             = 10.0.0.2

2:      IP protocol version = ipv6
        Address origin      = automatic
        IP address          = 3ffe:80c0:22c:4e:a:0:2:7f/64
        Subnet mask         =
        Gateway             = 3ffe
```



Change interface settings

Change the settings for an interface.

Format

```
/net/if/mgmt set { -ipv4 | -ipv6 } {disabled | automatic | static [-addr <value>] [-netmask <value>] [-gateway <value>] }
```

Action qualifier

Qualifier	Description
-ipv4	Specifies the IPv4 origin. Value is one of the following: <ul style="list-style-type: none">• disabled — Indicates the interface is disabled.• automatic — Indicates the IP attributes are set automatically by DHCP.• static — Indicates the IP attributes are set manually
-ipv6	Specifies the IPv6 origin. Value is one of the following: <ul style="list-style-type: none">• disabled — Indicates the interface is disabled.• automatic — Indicates the IP attributes are set automatically by DHCP. or SLAAC. Multiple addresses are possible• static — Indicates the IP attributes are set manually.
-addr	Specifies the IPv4 or IPv6 address of the interface. Optionally, you can also specify the prefix length in the following format: <IP address>/<prefix length>.  NOTE: The default prefix length for IPv6 is 64.
-netmask	Specifies the IPv4 subnet mask for the interface.  NOTE: This is optional if you specify the prefix length in the -addr attribute.
-gateway	Specifies the IPv4 or IPv6 gateway for the interface.

Example

The following command changes the IP address, the netmask, and the gateway for interface IF_1:

```
uemcli /net/if/mgmt set -ipv4 static -addr 192.168.1.1 -netmask 255.255.255.0 -gateway 192.168.1.2
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

Operation completed successfully.
```

Manage network interfaces

Create interfaces to enable and control access between the system, the network, and configured hosts. 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:


- iSCSI interfaces for controlling access to iSCSI storage. You assign the interface to an iSCSI node.
- Replication interfaces for replication-related data or management traffic.

The system configures each interface on a pair of symmetrical SP ports. The interface can be moved between SPs. 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.

Each interface is identified by an ID.

The following table lists the interface attributes with a description of each.

Table 53. Interface attributes

Attribute	Description
ID	ID of the interface.
Type	Interface type. Value is one of the following: <ul style="list-style-type: none"> • <code>iscsi</code> — Interface for iSCSI storage. • <code>replication</code> — Interface for replication-related data or management traffic.
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 1-4095. <div>  NOTE: If no VLAN ID is specified, which is the default, packets do not have VLAN tags. The Unisphere online help provides more details about VLANs. </div>
IP address	IPv4 or IPv6 address.
Subnet mask	IPv4 subnet mask.
Gateway	IPv4 or IPv6 gateway.
MAC address	MAC address of the interface.
SP	SP that uses the interface.
Health state	A numerical value indicating the health of the system. Value is one of the following: <ul style="list-style-type: none"> • Unknown (0) • OK (5) • OK BUT (7) • Degraded/Warning (10) • Minor failure (15) • Major failure (20)
Health details	Additional health information.

Create interfaces

Create an interface.

Format

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

Action qualifier

Qualifier	Description
-async	Run the creation operation in asynchronous mode.
-type	Specify the interface type. Value is one of the following: <ul style="list-style-type: none">• <code>iscsi</code> — Interface for iSCSI storage.• <code>replication</code> — Interface for replication-related data or management traffic.
-port	Specify the ID of the SP port or link aggregation that will use the interface. i NOTE: For systems with two SPs, a file interface is created on a pair of symmetric Ethernet ports rather than on a single specified port. Its current port is defined by NAS server SP and may differ from the specified port. For example, if the user specifies port <code>spa_eth2</code> , but the NAS server is on SP B, the interface is created on port <code>spb_eth2</code> .
-vlanId	Specify the virtual LAN (VLAN) ID for the interface. The interface uses the ID to accept packets that have VLAN tags. The value range is 1–4095. i NOTE: If no VLAN ID is specified, which is the default, packets do not have VLAN tags. The Unisphere online help provides more details about VLANs.
-addr	Specify the IP address for the interface. The prefix length should be appended to the IPv6 address and, if omitted, will default to 64. For IPv4 addresses, the default length is 24. The IPv4 netmask may be specified in address attribute after slash.
-netmask	Specify the subnet mask for the interface. i NOTE: This qualifier is not required if the prefix length is specified in the <code>-addr</code> attribute.
-gateway	Specify the gateway for the interface. i NOTE: This qualifier configures the default gateway for the specified port's SP.

Example

The following command creates a replication interface. The interface receives the ID `IF_1`:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /net/if create -type replication -port eth1_spb -addr 10.0.0.1 -netmask 255.255.255.0 -gateway 10.0.0.1
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection
```

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

View interfaces

View a list of interfaces on the system. You can filter on the interface ID.

i **NOTE:** The `show action command` on page 21 explains how to change the output format.

Format

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

Object qualifier

Qualifier	Description
-id	Type the ID of an interface.
-port	Type the port the interface is associated with.
-type	Specify the type of the interface. Valid values are: <ul style="list-style-type: none">• iscsi• replication

Example

The following command displays the details of all interfaces on the system.

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

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

1:      ID              = if_0
      Type              = file
      NAS server        = nas_0
      Port              = eth0_spa
      VLAN ID           = 0
      IP address         = 3ffe:80c0:22c:4e:a:0:2:7f/64
      Subnet mask        =
      Gateway           = fe80::20a8bff:fe5a:967c
      IPv4 mode          =
      IPv4 address       =
      IPv4 subnet mask   =
      IPv4 gateway       =
      IPv6 mode          = static
      IPv6 address       = 3ffe:80c0:22c:4e:a:0:2:7f/64
      IPv6 link-local address =
      IPv6 gateway       = fe80::20a8bff:fe5a:967c
      MAC address        = EA:3E:22:3F:0C:62
      SP                = spa
      Preferred          = yes

2:      ID              = if_1
      Type              = file
      NAS server        = nas_1
      Port              = eth1_spb
      VLAN ID           = 1
      IP address         = 192.168.1.2
      Subnet mask        = 255.255.255.0
      Gateway           = 192.168.1.254
      IPv4 mode          = static
      IPv4 address       = 192.168.1.2
      IPv4 subnet mask   = 255.255.255.0
      IPv4 gateway       = 192.168.1.254
      IPv6 mode          =
      IPv6 address       =
      IPv6 link-local address =
      IPv6 gateway       =
      MAC address        = EA:3E:22:21:7A:78
      SP                = spa
      Preferred          = yes

3:      ID              = if_2
      Type              = replication
      NAS server        =
      Port              = eth1_spb
      VLAN ID           =
      IP address         = 10.103.75.56
      Subnet mask        = 255.255.248.0
```

```

Gateway                = 10.103.72.1
IPv4 mode               = static
IPv4 address           = 10.103.75.56
IPv4 subnet mask       = 255.255.248.0
IPv4 gateway           = 10.103.72.1
IPv6 mode               =
IPv6 address           =
IPv6 gateway           =
MAC address            = EA:3E:22:6D:BA:40
SP                      = spb
Preferred               = no

```

Change interface settings

Change the settings for an interface.




Format

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

Object qualifier

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

Action qualifier

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 1–4095.  NOTE: If no VLAN ID is specified, which is the default, packets do not have VLAN tags. The Unisphere online help provides more details on VLANs.
-addr	Specify the IP address for the interface.  NOTE: The prefix length should be appended to the IPv6 address. The IPv4 netmask may be specified in address attribute after the slash.
-netmask	Specify the IPv4 subnet mask for the interface.
-gateway	Specify the gateway for the interface.  NOTE: The gateway is optional for both IPv4 and IPv6. This qualifier configures the default gateway for the specified port's SP.

Example

The following command changes the gateway address for interface IF_1:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /net/if -id IF_1 set -gateway 2001:db8:0:170:a:0:2:70
```

```


Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

```

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

Delete interfaces

Delete an interface.

 **NOTE:** 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
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection


Operation completed successfully.
```

Manage static IP routes

A route determines where to forward a packet destined for a non-local subnet so it can reach its destination, whether that destination is a network or host. A static IP route is a host, network, or default route that is configured manually.

The system selects a route in order from most specific to least specific, as follows:

1. Host (most specific)
2. Network
3. Default (least specific)

 **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.

The following table describes the attributes for static IP routes.

Table 54. 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. View interfaces on page 180 explains how to view the network interface IDs.
Route type	Type of route. Valid values are:

Table 54. Static IP route attributes (continued)

Attribute	Description
	<ul style="list-style-type: none"> • <code>default</code> — Default gateway the system uses when it cannot find a route to a connected node. • <code>host</code> — Static route to a specific host. • <code>net</code> — Static route to a subnet IP address.
Target	IP address of the target network node based on the specified route type. Valid values are: <ul style="list-style-type: none"> • For default, there is no value, as the system will use the specified gateway IP address. • For host, the value is the IP address of the host. • For net, the value is a subnet IP address.
Netmask	For a subnet route, the IP address of the subnet mask.
Gateway	IP address of the gateway.
Health state	A numerical value indicating the health of the system. Valid values are: <ul style="list-style-type: none"> • Unknown (0) • OK (5) • OK BUT (7) • Degraded/Warning (10) • Minor failure (15) • Major failure (20)
Health details	Additional health information. See Appendix A, Reference, for health information details.

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>]
```

Action qualifier

Qualifier	Description
<code>-if</code>	Type the ID of the interface that the route will use to reach the gateway. View interfaces on page 180 explains how to view the network interface IDs.  NOTE: The system may not use the interface you type for the route. The system determines the best interface for the route automatically.
<code>-type</code>	Type the type of route. Value is one of the following: <ul style="list-style-type: none"> • <code>default</code> — System uses the default gateway when it cannot find a route to a connected node. • <code>host</code> — Create a route to a host. • <code>net</code> — Create a route to a subnet.
<code>-target</code>	Type the IP address for the target network node based on the value of <code>-type</code> . Value is one of the following: <ul style="list-style-type: none"> • For default, the system will use the IP address specified for <code>-gateway</code>. • For host, type the IP address of a target host. • For net, type the IP address of a target subnet. Include the <code>-netmask</code> qualifier to specify the IP address of the subnet mask.

Qualifier	Description
-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 network route for interface if_1 to reach the 10.64.74.x subnet using gateway 10.64.74.1:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /net/route create -if IF_1 -type net -target 10.64.200.10 netmask 255.255.255.0 -gateway 10.64.74.1
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection
```

```
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 21 explains how to change the output format.

Format

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

Object qualifier

Qualifier	Description
-id	Specifies the ID of a route.
-if	Specifies the network interface for which you want to return routes.

Example

The following command displays details of the IP routes RT_1, RT_2, and RT_3:

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

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection
```

```
1:      ID          = RT_1
      Type          = net
      Target        = 10.64.74.10
      Netmask       = 255.255.255.0
      Gateway       = 10.0.0.1
      Interface     = IF_1
      Health state  = OK (5)
```

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

```
Health state = OK (5)

3: ID = RT_3
   Type = host
   Target = 10.64.74.168
   Netmask =
   Gateway = 10.0.0.3
   Interface = IF_3
   Health state = OK (5)
```

Change IP routes

Modify an existing IP route.

Format

```
/net/route set route -id <value> set [-type {default | host | net}] [-target <value> [-netmask <value>]] [-gateway <value>]
```

Object qualifier

Qualifier	Description
-id	Identifies the route object.

Action qualifier

Qualifier	Description
-type	Specify the type of route. Only one default IPv4 route instance is allowed. Valid values are (case-insensitive): <ul style="list-style-type: none">• default — System uses the default gateway when it cannot find a more specific host or network route.• host — Create a route to a host.• net — Create a route to a subnet.
-target	Specify the destination IP address or a range of IP addresses. If the route type is: <ul style="list-style-type: none">• host, the value is an IP address of the host.• net, the value is a subnet IP address with the following format: <IPv4 address>/[<prefix length>] or <IPv6 address>/[<prefix length>]. Default prefix length is 24 for IPv4 address and 64 for IPv6 address. Valid values are: <ul style="list-style-type: none">• For a default route, the system uses the IP address specified for -gateway.• For a host route, specify the IP address of a target host.• For a net route, specify the IP address of a target subnet. Include the -netmask qualifier to specify the IP address of the subnet mask.
-netmask	For a route to a subnet, type the IP address of the subnet mask.
-gateway	Specify the gateway IP address for the route.

Example

The following command changes the target IP address to 10.64.200.11, the netmask to 255.255.255.0, and the gateway to 10.64.74.2 for IP route RT_1:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /net/route -id RT_1 set -target 10.64.200.11 -netmask 255.255.255.0 -gateway 10.64.74.2
```

```
Storage system address: 10.64.75.201
Storage system port: 443
HTTPS connection
```

```
ID = RT_1
Operation completed successfully.
```

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
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection
```

```
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 following table describes the attributes for link aggregation.

Table 55. 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. Valid values are: <ul style="list-style-type: none"> • SPA • SPB
MTU size	Maximum transmission unit (MTU) packet size (in bytes) for the linked ports. Default is 1500 bytes per packet.
Linux device name	Linux network device name.
FSN port ID	ID of the FSN port to which the link aggregation belongs, if it is part of an FSN.
Available MTU size	List of available MTU sizes.  NOTE: This displays as an interval defined by the minimum and maximum values, for example: 1280-9216.
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"> • Unknown (0) — Status is unknown. • OK (5) — Working correctly. • OK BUT (7) — Lost connection, but the link aggregation is not in use. • 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 need 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.
Health details	Additional health information.

Create link aggregations

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

Format

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

Action qualifier

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. The MTU size can be set to a custom value between 1280 and 9216. Specific I/O modules may restrict allowed range for MTU size value. The MTU size values of 1500 bytes (default) and 9000 bytes (jumbo frame) are supported by all interfaces and I/O modules.

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"
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

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.

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 -detail
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

1:      ID                = spa_la_0_2
        SP                = spa
        Ports             = spa_iom_0_eth2, spa_iom_0_eth3
        FSN port ID       = None
        MTU size          = 3456
        Available MTU sizes = 1280-9216
        Linux device name  = bond12
        Health state       = OK (5)
        Health details     = "The component is operating normally. No action is required."
```

```

Operational status =
2: ID = spb_la_0_2
SP = spb
Ports = spb_iom_0_eth2, spb_iom_0_eth3
FSN port ID = None
MTU size = 3456
Available MTU sizes = 1280-9216
Linux device name = bond12
Health state = OK (5)
Health details = "The component is operating normally. No action is required."
Operational status =

```

Change link aggregations

Change the settings of a link aggregation.

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 qualifier

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. The MTU size can be set to a custom value between 1280 and 9216. Specific I/O modules may restrict allowed range for MTU size value. The MTU size values of 1500 bytes (default) and 9000 bytes (jumbo frame) are supported by all interfaces and I/O modules.

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
```

```

Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

ID = la0_SPA
ID = la0_SPB
Operation completed successfully.

```

Delete link aggregations

Delete a link aggregation.

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
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

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

Manage Fail-safe networking (physical deployments only)

Learn about Fail-safe networking (FSN) and which attributes are used to manage FSN in the CLI.

A Fail-Safe Network (FSN) is a high-availability feature that extends link failover into the network by providing switch-level redundancy. An FSN appears as a single link with a single MAC address and potentially multiple IP addresses. An FSN can be a port, a link aggregation, or any combination of the two. An FSN adds an extra layer of availability to link aggregations alone. Link aggregations provide availability in the event of a port failure. FSNs provide availability in the event of a switch failure. Each port or link aggregation is considered as a single connection. Only one connection in an FSN is active at a time. All the connections making up the FSN share a single hardware (MAC) address.

If the system detects a failure of the active connection, it will automatically switch to the standby connection in the FSN. That new connection assumes the network identity of the failed connection, until the primary connection is available again. You can designate which connection is the primary port/connection. To ensure connectivity in the event of a hardware failure, create FSN devices on multiple I/O modules or onboard ports. The FSN components are connected to different switches. If the network switch for the active connection fails, the FSN fails over to a connection using a different switch, thus extending link failover out into the network.


When replicating from one Unity system to another, configure the FSN the same way on both systems as a best practice. You will need to manually configure the FSN on the destination before setting up replication. Otherwise, if you set up the FSN on the destination after replication is configured, you will need to use the override option to select the FSN as the interface for the destination NAS server.

NOTE: A NAS server IP interface should be build on the highest level logical device. If you want to repurpose a port or link aggregation currently used as a NAS server IP interface for an FSN, you will need to remove the IP interface from the NAS server, create the FSN, and reassign the IP interface to the FSN device.

Table 56. FSN attributes

Attribute	Description
ID	ID of the Fail-Safe Networking port.
SP	Storage processor the FSN is on.
MTU size	Maximum Transmission Unit (MTU) size.

Table 56. FSN attributes (continued)

Attribute	Description
Available MTU sizes	List of available MTU sizes.  NOTE: This displays as an interval defined by the minimum and maximum values, for example: 1280-9216.
Linux device name	Name of the Linux network device.
Primary port	ID of the primary port used in the FSN. The primary port cannot be removed.
Secondary ports	Comma-separated list of the other secondary ports in the FSN. This includes both link aggregations and ethernet ports.
Active port	ID of the active port for the FSN.
Health state	The health state of the FSN. Valid values are: <ul style="list-style-type: none"> OK (5) — The FSN is operating normally, or the active port of the FSN has changed. Degraded/Warning (10) — Performance of the FSN has degraded. Minor failure (15) — An FSN port link is down. Major failure (20) — An FSN port is missing ports, or an FSN port is not symmetrical.
Health details	Detailed health information for the FSN.

Create an FSN

Use the CLI to create a fail-safe network.

Create a fail-safe network using two or more ports or link aggregations.

Format

```
/net/fsn create -primaryPort <value> -secondaryPorts <value> [-mtuSize <value>]
```

Action qualifier

Qualifier	Description
-primaryPort	Type the ID of the primary port for the FSN. This can be either an ethernet port or link aggregation.
-secondaryPorts	Type the comma-separated list of additional port or link aggregation IDs to be included in the FSN.
-mtuSize	Optionally, type the Maximum Transmission Unit size for the FSN. The MTU must be in the range allowed for all of the ports included in the FSN. The MTU size can be set to a custom value between 1280 and 9216. Specific I/O modules may restrict allowed range for MTU size value. The MTU size values of 1500 bytes (default) and 9000 bytes (jumbo frame) are supported by all interfaces and I/O modules.

Example

The following example creates an FSN where the primary port is a single ethernet port, and the secondary ports include a link aggregation and additional single ethernet port.


```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /net/fsn create -primaryPort spa_eth0 -
secondaryPorts "spa_la_2,spa_eth3"
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

ID = spa_fsn_0
ID = spb_fsn_0

Operation completed successfully.
```

View FSN settings

Review the list and details of each FSN on the system.

Format

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

Object qualifier

Qualifier	Description
-id	Type the ID for the FSN port for which you would like to view details. Do not specify to see details for all FSNs on the system.

Example

The following example shows the details of all the FSNs on the system.

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

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

1:  ID          = spa_fsn_0_1
    SP          = spa
    Primary port = spa_iom_0_eth1
    Secondary ports = spa_la_2
    Active port  = spa_iom_0_eth1
    MTU size     = 1500
    Available MTU sizes = 1500,9000
    Health state  = OK (5)
    Health details = "FSN port is operating normally."

2:  ID          = spb_fsn_0_1
    SP          = spb
    Primary port = spb_iom_0_eth1
    Secondary ports = spb_la_2
    Active port  = spb_iom_0_eth1
    MTU size     = 1500
    Available MTU sizes = 1500,9000
    Health state  = OK (5)
    Health details = "FSN port is operating normally."
```

Change an FSN

Make changes to an existing FSN.

Change a fail-safe network by modifying the included secondary ports or MTU sizes.

Format

```
/net/fsn -id <value> set [-secondaryPorts <value>] [-mtuSize <value>]
```

Object qualifier

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

Action qualifier

Qualifier	Description
-secondaryPorts	Type the list of full IDs of the physical ports and/or link aggregation ports for the FSN. Remove any from the list you wanted deleted from the FSN, and add any you want included.
-mtuSize	Type the new Maximum Transmission Unit (MTU) size for the FSN. The MTU must be in the range allowed for all of the ports included in the FSN. The MTU size can be set to a custom value between 1280 and 9216. Specific I/O modules may restrict allowed range for MTU size value. The MTU size values of 1500 bytes (default) and 9000 bytes (jumbo frame) are supported by all interfaces and I/O modules.

Example 1

The following example changes the MTU size of the FSN "spa_fsn_0".

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /net/fsn -d spa_fsn_0 set -mtuSize 9000
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

ID = spa_fsn_0
ID = spb_fsn_0

Operation completed successfully.
```

Example 2

The following example shows an attempt to add Ethernet port "spa_iom_0_eth2" to FSN "spa_fsn_0", however this ethernet port is already in use for another link aggregation and could not be added independently to the FSN.

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /net/fsn -d spa_fsn_0 set -secondaryPorts
spa_iom_0_eth2
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

Operation failed. Error code: 0x6000851
```

One of the specified ports cannot be used to configure an FSN because to it is already included in an FSN or link aggregation. (Error Code:0x6000851)

Delete an FSN

Delete an FSN from the system.

Delete a fail-safe network.

Format

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

Object qualifier

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

Example

The following example deletes FSN "spa_fsn_0"

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /net/fsn -id spa_fsn_0 delete
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

ID = spa_fsn_0
ID = spb_fsn_0

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 host names 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 domains allow configuring DNS server addresses. All addresses are grouped under user-defined DNS server domains. DNS settings are identified by NAS server domain ID. NAS server DNS settings should allow DNS resolution of all names within an SMB server domain in order for the SMB protocol to operate normally within an Active Directory domain.

NOTE: 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.

The following table lists the attributes for DNS domains.

Table 57. DNS domain and server attributes

Attribute	Description
NAS server	ID of the associated NAS server.
Name	Name of the DNS domain.
Auto-configuration enabled	Indicates whether DNS addresses are configured automatically.
Name servers	List of IP addresses that correspond to the name servers in the domain.
Replication sync	<p>Indicates the status of the DNS list in the NAS server operating as a replication destination. When a replicated DNS servers list is created on the source NAS server, it is automatically synchronized to the destination. Valid values are:</p> <ul style="list-style-type: none"> • <code>Not replicated</code> – DNS list is not replicated over to the destination. • <code>Auto synchronized</code> – DNS list is automatically synchronized over to the replication destination. Any modify or delete operations at the source will automatically be reflected on the destination. • <code>Overridden</code> – DNS list has been manually modified or overridden on the replication destination. Modifications or deletions of addresses from the DNS list on the source NAS server will have no effect on the overridden DNS list on the replication destination. <p> NOTE: When a DNS list is disabled or deleted from the source, overridden DNS list in the destination may not get disabled or deleted automatically.</p>
Source name servers	List of name server IP addresses defined on the replication source.

Configure DNS settings

Configure the DNS settings for the storage system.

Format

```
/net/dns/config set {-nameServer <value> | -auto | -noNameServer}
```

Action qualifier

Qualifier	Description
<code>-nameServer</code>	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.
<code>-auto</code>	Set DNS addresses dynamically.
<code>-noNameServer</code>	Clear the list of IP addresses.

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"
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

Operation completed successfully.
```

View default DNS addresses

View the DNS server addresses designated as a default.

Format

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

Example

The following command displays the DNS server addresses:

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

Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

1. Auto-configuration enabled = no
   Name servers                = 10.5.3.29,10.5.3.32,2001:db8:170:9400:212:3fff:fe2a:8812
```

View DNS server domains

View details about configured DNS server domains.

 **NOTE:** The `show` action command on page 21 explains how to change the output format.

Format

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

Object qualifier

Qualifier	Description
-server	Type the ID of the associated NAS server.

Example

The following command lists all DNS server domains:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /net/nas/dns -server nas_1 show -detail

Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

1:      NAS server          = nas_1
      Name                  = domain.one.com
      Name servers          = 10.64.74.1,10.64.74.201
      Replication sync      = Overridden
      Source name servers   = 10.64.74.1,10.64.74.201
```

Configure a DNS domain

Configure a DNS server domain.

Format

```
/net/nas/dns -server <value> set { [-name <value>] [-nameServer <value>]| -enabled no} [-replSync {auto | overridden}]
```

Object qualifier

Qualifier	Description
-server	Type the name of the associated NAS server.

Action qualifier

Qualifier	Description
-name	Type the name of the associated NAS server.
-nameServer	Type the IP addresses of the DNS servers. Separate the addresses using a comma.
-enabled	Set the value to no to remove DNS settings for the NAS server. Valid value is no.
-replSync	Status of the DNS list in the NAS server operating as a replication destination. Valid values are: <ul style="list-style-type: none">• auto• overridden

Example

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

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /net/nas/dns -server nas_1 set -name "newdomain.one.com"
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

Operation completed successfully.
```

Manage NTP server settings

NOTE: NTP is not required, but some functionality is unavailable without it.

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 NAS server for CIFS (SMB) 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. NTP is not required, but some functionality is unavailable without it.


The following table lists the attributes for the NTP server record.

Table 58. 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 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> [-force {noReboot | allowReboot | allowDU}]
```

Action qualifier

Qualifier	Description
-server	Type the name or IP address of an NTP server.
-force	Accept or decline the system reboot, which may be needed to complete the time change. If the qualifier isn't specified, you will be asked to confirm reboot if it's needed. Valid values are: <ul style="list-style-type: none">• noReboot• allowReboot• allowDU  NOTE: Note: allowDU is used if the system is in a degraded state or has one SP (data will be unavailable during its reboot). Otherwise allowReboot is used. In silent mode, system will be rebooted if needed.

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
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection
```

```
ID = NTP_0.north-america.pool.ntp.org
Operation completed successfully.
```

View NTP server settings

View details about the NTP server.

 **NOTE:** The [show action command](#) on page 21 explains how to change the output format.

Format

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

Object qualifier

Qualifier	Description
-id	Type the ID of the NTP server.

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
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

1:      ID      = NTP_0.north-america.pool.ntp.org
      Server   = 0.north-america.pool.ntp.org

2:      ID      = NTP_1.north-america.pool.ntp.org
      Server   = 1.north-america.pool.ntp.org
```

Configure NTP server settings

Configure the NTP server setting.

Format

```
/net/ntp/server set -addr <value>
```

Action qualifier

Qualifier	Description
-addr	Enter a list of one or more IP addresses or network names of each NTP server to include in the NTP server setting. Separate the addresses with a comma.


Example

The following command adds two IP addresses to the NTP server setting:

```
uemcli -d 10.0.0.1 -u Local/joe -p 12345 /net/ntp/server set -addr
"10.64.75.55,10.64.75.44"
```

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
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection
```

```
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 file system shares, some NDMP products require information from NIS servers to back up file system data.

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

The following table lists the attributes for NIS servers domains.

Table 59. NIS server domain attributes

Attribute	Description
NAS server	ID of the associated NAS server.
Domain	Name of the NIS server domain.
Servers	List of IP addresses of the NIS servers in the domain.
Replication sync	<p>Indicates the status of the NIS server addresses list in the NAS server operating as a replication destination. When a replicated NIS servers list is created on the source NAS server, it is automatically synchronized to the destination. Valid values are:</p> <ul style="list-style-type: none">• <code>Not replicated</code> – NIS list is not replicated over to the destination.• <code>Auto synchronized</code> – NIS list is automatically synchronized over to the replication destination. Any modify or delete operations at the source will automatically be reflected on the destination.• <code>Overridden</code> – NIS list has been manually modified or overridden on the replication destination. Modifications or deletions of addresses from the NIS list on the source NAS server will have no effect on the overridden NIS list on the replication destination. <p> NOTE: When a NIS list is disabled or deleted from the source, overridden NIS list in the destination may not get disabled or deleted automatically.</p>
Source servers	List of IP addresses for the NIS servers defined on the replication source.

View NIS server domains

View details about NIS server domains.

Format

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

Object qualifier

Qualifier	Description
-server	Type the ID of the associated NAS server

Example

The following command displays details about the NIS server domain:

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

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

1:      NAS server      = nas_0
      Domain           = nis.one.com
      Servers           = nisserv1.one.com,10.64.74.1
      Replication sync  = Overridden
      Source servers    = 10.64.74.74,10.64.74.1
```

Change NIS server domains

Add NIS server addresses to an NIS server domain.

Format

```
/net/nas/nis -server <value> set { [-domain <value>] [-ip <value>] | {-enabled no}} [-replSync {auto | overridden}]
```

Object qualifier

Qualifier	Description
-server	Type the ID of the associated NAS server

Action qualifier

Qualifier	Description
-domain	Type the NIS domain name.
-ip	Type the IP addresses of the NIS servers to include in the domain. Separate the addresses with a comma.
-enabled	Set the value to no to remove NIS settings for the NAS server. Valid value is no.
-replSync	Status of the NIS list in the NAS server operating as a replication destination. Valid values are:

Qualifier	Description
	<ul style="list-style-type: none"> • auto • overridden

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/nas/nis -id nis.two.com set -ip "10.64.74.200"
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection
```

```
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. 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.

[Configure alert settings](#) on page 521 explains how to specify the alert severity of which to e-mail alerts. All IP addresses are grouped under a single SMTP server setting.

The following table lists the attributes for SMTP server settings.

Table 60. SMTP server attributes

Attribute	Description
ID	ID of the SMTP server.
Address	IP address of the SMTP server.
Port	Port of the SMTP server.
Encryption level	Encryption level (SSL method) used to communicate with the SMTP server. Valid values are: <ul style="list-style-type: none"> • None • Start TLS • SSL
Authentication type	Type of authentication used to log in to the SMTP server. Valid value are: <ul style="list-style-type: none"> • None • Plain • Login • CRAM_MD5 • DIGEST_MD5
User name	User name used to log in to the SMTP server.
Bypass proxy	Indicates whether or not the global proxy settings will be bypassed. <ul style="list-style-type: none"> • yes: Global proxy server settings are ignored and the SMTP server will be accessed directly.

Table 60. SMTP server attributes (continued)

Attribute	Description
	<ul style="list-style-type: none">no (default): Global proxy server settings are used to access the SMTP server.

View SMTP server settings

View the IP addresses of the SMTP servers.

 **NOTE:** The `show action command` on page 21 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
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

1:      ID              = default
      Address          = 192.168.0.15
      Port             = 25
      Encryption level  = SSL
      Authentication type = Plain
      User name         = test
      Bypass proxy      = no
```

Configure SMTP server settings

Specify the IP addresses for the SMTP server setting.

Format

```
/net/smtp -id <value> set -addr <value> [-port <value>] [-encryptLevel {none|startTLS|
ssl}] [-authType {none|plain|login|cram_md5|digest_md5}] [-user <value> {-passwd <value> |-
passwdSecure}] [-bypassproxy {yes|no}]
```

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. Note that the address can be either IPv4 or IPv6.
-port	Enter the port of the SMTP server.
-encryptLevel	Specifies the encryption level (SSL method) of the SMTP server. Valid values are: <ul style="list-style-type: none">• none• startTLS• ssl
-authType	Specifies the authentication type of the SMTP server. Valid values are: <ul style="list-style-type: none">• none• plain• login• cram_md5• digest_md5
-user	Specifies the user name of the SMTP server.
-passwd	Specifies the password of the SMTP server.
-passwdSecure	Specifies the password in secure mode. The user will be prompted to input the password.
-bypassproxy	Specifies whether the global proxy settings are bypassed when accessing the SMTP server. Valid values are: <ul style="list-style-type: none">• yes: Ignores the global proxy server settings to access the SMTP server directly.• no (default): Uses the global proxy server settings.

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 -port 25 -encryptLevel ssl -authType plain -user test -passwd test
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

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 file system storage.

The following table lists the attributes for NDMP servers.

Table 61. NDMP server attributes

Attribute	Description
NAS server	ID of the associated NAS server.
Enabled	Indication of whether NDP is enabled. Value is yes or no.
Username	User name for accessing the NDMP server.

Table 61. NDMP server attributes (continued)

Attribute	Description
Password	Password for accessing the NDMP server.

View NDMP server settings

View whether NDMP is enabled or disabled.

Format

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

Object qualifier

Qualifier	Description
-server	Type the ID of the associated NAS server.

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/nas/ndmp show
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection
```

```
1:      NAS server  = nas_0
      Enabled      = yes
```

```
2:      NAS server  = nas_1
      Enabled      = no
```

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/nas/ndmp -server <value> set -enabled {yes {-passwd <value> | -passwdSecure} | no}
```

Object qualifier

Qualifier	Description
-server	Type the ID of the associated NAS server.

Action qualifier

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.
-passwdSecure	Specify the password in secure mode - the user will be prompted to input the password and the password confirmation.

Example

The following command enables NDMP:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /net/nas/ndmp -server nas_0 set -enabled yes -passwd "Password0123"
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

Operation completed successfully.
```

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.

The following table lists the attributes for LDAP settings.

NOTE: If you intend to use LDAP with SSL, you must upload the CA certificate of the LDAP server to the system by using the `-upload` command before configuring the LDAP settings. For example:

```
uemcli -d 10.0.0.1 -u admin -p MyPwd -upload -f /tmp/myldapservercertificate.cer /sys/cert -type CA -service Mgmt_LDAP
```

Table 62. LDAP server attributes

Attribute	Description
ID	ID of the LDAP server.
Auto discovery enabled	Indicates whether the LDAP server names are obtained using DNS. To use this feature, the DNS server for the LDAP domain must be configured as the first server in the list of DNS servers.
Name	Server hostnames or IP addresses of the LDAP servers, specified as a comma-separated list. If IP addresses are specified, the DNS Server for the LDAP domain must be configured with a reverse lookup so that it provides the FQDN for the specified IP addresses.
Domain name	Domain name for the LDAP server.

Table 62. LDAP server attributes (continued)



Attribute	Description
Port	Port number used by the directory server for LDAP communications. By default, LDAP uses port 389, and LDAP over SSL (LDAPS) uses port 636. For forest-level authentication, specify port 3268 for LDAP or port 3269 for LDAPS.
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"> • <code>ldap</code> (default) — LDAP without SSL. • <code>ldaps</code> — LDAP with SSL.
Bind DN	Distinguished name (DN) for a user with administrator privileges on the LDAP Server. The DN can be expressed in several formats. For example: <code>cn=Administrator,cn=Users,dc=mycompany,dc=com</code> <code>Administrator@mycompany.com</code> <code>mycompany.com/Administrator</code>
Bind password	Password to be used for binding to the LDAP server. This is the password for the user specified in the <code>Bind DN</code> attribute.
User search path	Path to search for users on the directory server. For example: <code>ou=People,dc=1ss,dc=emc,dc=com</code> .  NOTE: 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: <code>uid=<name>,ou=people,dc=<domaincomponent>,or dc=<domain component></code> .  NOTE: 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 <code>uid</code> . For forest-level authentication, specify <code>userPrincipalName</code> .
Group name attribute	Name of the LDAP attribute whose value indicates the group name. Default value is <code>cn</code> .
User object class	LDAP object class for users. Default is <code>user</code> . In Active Directory, groups and users are stored in the same hierarchical directory path and the class is called <code>group</code> .
Group object class	LDAP object class for groups. Default value is <code>group</code> . In Active Directory, groups and users are stored in the same directory path and the class is called <code>group</code> .
Group member class	Name of the LDAP attribute whose value contains names of group members within a group. Default value is <code>member</code> .
Certificate filepath	Path to (filename of) the trusted certificate file used for one-way LDAP server authentication. The chain cannot contain the server certificate.
LDAP timeout	Timeout for the LDAP server in milliseconds. If the system does not receive a reply from the LDAP server after the

Table 62. LDAP server attributes (continued)

Attribute	Description
	specified timeout, it stops sending requests. Default value is 10,000 milliseconds, or 10 seconds.

Configure LDAP settings

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

NOTE: If you intend to use LDAP with SSL, you must upload the CA certificate of the LDAP server to the system by using the `-upload` command before configuring the LDAP settings. For example:



```
uemcli -d 10.0.0.1 -u admin -p MyPwd -upload -f /tmp/myldapservercertificate.cer
/sys/cert -type CA -service Mgmt_LDAP
```

Format

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

Action qualifier

Qualifier	Description
-name	Type the LDAP IP addresses or hostnames as a comma-separated string. If IP addresses are specified, the DNS server for the LDAP domain must be configured with a reverse lookup so that it provides the FQDN for a specified IP address.
-autoDiscoveryEnabled	Specify to direct the system to obtain the LDAP server addresses using DNS. To use this feature, the DNS server for the LDAP domain must be configured as the first server in the list of DNS servers. NOTE: -autoDiscoveryEnabled is the default if you do not specify either -name or -autoDiscoveryEnabled.
-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. Valid values are: <ul style="list-style-type: none"> ldap (default) — LDAP without SSL. ldaps — LDAP with SSL.
-certFilePath	Path to (filename of) the trusted certificate file used for one way server authentication. NOTE: If the value of -protocol 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. For forest-level authentication, specify port 3268 for LDAP or port 3269 for LDAPS.
-bindDn	Type the distinguished name (DN) for a user with administrator privileges on the LDAP Server. The DN can be expressed in several formats. For example: <pre>cn=Administrator,cn=Users,dc=mycompany,dc=com Administrator@mycompany.com mycompany.com/Administrator</pre>

Qualifier	Description
-bindPasswd	Type the password to be used for binding to the LDAP server. This is the password for the user specified in the Bind DN attribute.
-bindPasswdSecure	Specify the password in secure mode - the user will be prompted to input the password.
-userSearchPath	Type the path to search for users on the directory server. For example: ou=People,dc=lss,dc=emc,dc=com  NOTE: 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: ai.uid=<name>,ou=people,dc=<domaincomponent>,or dc=<domain component> .  NOTE: 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 LDAP object class for users. Default value is user. 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. 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. Default is 10,000 milliseconds, or 10 seconds.

Example 1: Creating an LDAP configuration with a specific LDAP server address specified

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /net/ldap create -
name lpso242.lss.emc.com -domain domain.example.com -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
```

```
Storage system address: 10.64.75.201
Storage system port: 443
HTTPS connection
```

```
ID = LDAP_1
Operation completed successfully.
```

Example 2: Creating an LDAP configuration with multiple LDAP server address specified

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /net/ldap create -name
lpso242.lss.emc.com,lpso243.lss.emc.com -domain domain.example.com -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
```

```
Storage system address: 10.64.75.201
Storage system port: 443
HTTPS connection
```

```
ID = LDAP_1
Operation completed successfully
```

Example 3: Creating an LDAP configuration using auto discovery through DNS to configure the server addresses

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /net/ldap create
-autoDiscoveryEnabled -domain domain.example.com -port 389 -protocol
ldap -bindDn "cn=Administartor,ou=Users,dc=domain,dc=example,dc=com" -bindPasswd
Password0123 -userSearchPath "ou=Users,dc=domain,dc=example,dc=com" -groupSearchPath
"ou=Groups,dc=domain,dc=example,dc=com" -userIdAttr "uid" -groupNameAttr "cn" -
userObjectClass "interOrgPerson" -groupObjectClass "groupOfUniqueNames" -groupMemberAttr
"uniqueMember" -timeout 40000
```

```
Storage system address: 10.64.75.201
Storage system port: 443
HTTPS connection
```

```
ID = LDAP_1
Operation completed successfully
```

View LDAP settings

View details for configured LDAP settings.

 **NOTE:** The `show` action command on page 21 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

The following command displays the LDAP settings:

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

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection
```

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

Change LDAP settings

Update a configured LDAP setting.

NOTE: If you intend to use LDAP with SSL, you must upload the CA certificate of the LDAP server to the system by using the `-upload` command before configuring the LDAP settings. For example:

```
uemcli -d 10.0.0.1 -u admin -p MyPwd -upload -f /tmp/myldapservercertificate.cer  
/sys/cert -type CA -service Mgmt_LDAP
```

Format



```
/net/ldap -id <value> set [{-name <value> | -autoDiscoveryEnabled}] [-port <value>] [-  
protocol {ldap | ldaps {-certFilePath <value>}}] [-bindDn <value>] [-bindPasswd <value>  
| -bindPasswdSecure] [-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 qualifier

Qualifier	Description
-name	Type the IP addresses or hostnames of the primary directory servers to use for authentication. The values you type depends on the format of the subject field entry in each directory server's certificate. Typically, this requires a hostname. Type the LDAP IP addresses or hostnames as a comma-separated string. If IP addresses are specified, the DNS Server for the LDAP domain must be configured with a reverse lookup so that it provides the FQDN for the specified IP addresses.
-autoDiscoveryEnabled	Specify to direct the system to obtain the LDAP server addresses or hostnames using DNS. DNS must be configured for this option to take effect. NOTE: <code>-autoDiscoveryEnabled</code> is the default if you do not specify either <code>-name</code> or <code>-autoDiscoveryEnabled</code> .
-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. For forest-level authentication, specify port 3268 for LDAP or port 3269 for LDAPS.
-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">• <code>ldap</code> (default) — LDAP without SSL.• <code>ldaps</code> — LDAP with SSL.
-certFilePath	Path to (filename of) the trusted certificate file used for one way server authentication. NOTE: If the value of <code>-protocol</code> is <code>ldaps</code> , this qualifier is required.
-bindDn	Type the distinguished name (DN) for a user with administrator privileges on the LDAP Server. The DN can be expressed in several formats. For example: cn=Administrator,cn=Users,dc=mycompany,dc=com Administrator@mycompany.com mycompany.com/Administrator

Qualifier	Description
-bindPasswd	Type the password to be used for binding to the LDAP server. This is the password for the user specified in the Bind DN attribute. It is required when the -bindDn qualifier is included.
-bindPasswdSecure	Specifies the password in secure mode - the user will be prompted to input the password.
-userSearchPath	Type the path to search for users on the directory server. For example: ou=People,dc=Iss,dc=emc,dc=com.  NOTE: 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: uid=<name>,ou=people,dc=<domaincomponent>,or dc=<domain component>.  NOTE: 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. 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. 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. 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. Default is 10000 milliseconds, or 10 seconds.

Example

The following command updates the configured LDAP settings:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /net/ldap -id LDAP_1 set -server
lpso242.lss.emc.com -port 389
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection
```

```
ID = LDAP_1
Operation completed successfully.
```

Verify LDAP settings

Verify the connection to the LDAP server.

Format

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

Object qualifier

Qualifier	Description
-id	Identifies the LDAP server.

Example

The following command verifies the connection to the LDAP server:

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

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

Operation completed successfully.
```

Refresh the automatically-discovered LDAP server address list

Refreshes the auto discovered server address list for the specified LDAP server configuration. This can only be performed if auto-discovery is enabled.

Format

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

Object qualifier

Qualifier	Description
-id	Identifies the LDAP server.

Example

The following command refreshes the automatically-discovered LDAP server address list for the LDAP_1 server configuration:

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

```
Storage system address: 10.64.75.201
Storage system port: 443
HTTPS connection

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

The following command deletes the LDAP_1 setting:

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

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

Operation completed successfully.
```

Utility commands

Ping allows you to check connectivity between your system and a remote host. You may select the interface from which to ping. The system automatically identifies the SP to which the selected interface belongs.

Traceroute allows you to check the network route from the specified interface to a remote host. You may select the interface and the host address that are the endpoints of the route.

Ping

Ping a remote host from the specified NAS server interface (`-srcIf` parameter value).

Format

```
/net/util ping -srcIf <value> -addr <value>
```

Action qualifier

Qualifier	Description
<code>-srcIf</code>	Identifies the NAS server interface from which the packet will be sent. The value is an interface identifier. Use this qualifier when you want to test whether a specific NAS server interface can access a remote host.
<code>-addr</code>	Specify the destination address to use when sending the packet.

Example

The following example pings a remote host:

```
uemcli /net/util ping -srcIf if_0 -addr 10.0.0.1
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

Operation completed successfully
```

Trace route

Display the route from the specified interface to a remote host

Format

```
/net/util/traceroute -srcIf <value> -addr <value>
```

Action qualifier

Qualifier	Description
-srcIf	Identifies the interface from which the packet will be sent. The value is an interface identifier.
-addr	Specify the destination address to use when sending the packet.

Example

The following example shows trace route to a remote host:


```
uemcli /net/util/traceroute -srcIf if_0 -addr 10.0.0.1
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

1: Result = traceroute to 10.0.0.1 (10.64.74.57), 30 hops max, 40 byte packets using UDP
2: Result =  1  10.64.76.2 (10.64.76.2)  0.944 ms   0.801 ms   0.808 ms
3: Result =  2  10.64.74.57 (10.64.74.57)  0.431 ms   0.473 ms   0.354 ms
```

Manage Distributed Hierarchical Storage Management

Distributed Hierarchical Storage Management (DHSM) is required by the vCenter Plug-in application. The DHSM feature allows the VCenter Plug-in user to perform advanced file system functions.

 **NOTE:** This feature was formerly called Advanced Storage Access (ASA).

The following table lists the attributes for DHSM.

Table 63. DHSM attributes

Attribute	Description
NAS server	NAS server ID.
State	The state of the DHSM service. Valid values are: <ul style="list-style-type: none">• disabled• enabled
Username	The DHSM user name.
Password	The DHSM user password.
HTTPS enabled	Specifies whether SSL (HTTPS) is required for DHSM requests to this DHSM server. Valid values are: <ul style="list-style-type: none">• yes (default)• no

View DHSM settings

Displays DHSM settings.

Format

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


Object qualifier

Qualifier	Description
-server	Type the ID of the associated NAS server

Example

The following command displays the DHSM settings:

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

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection
```

```
1:      NAS server      = nas_0
        State           = Enabled
        Username        = Local/joe
        HTTPS enabled   = no
```

Change Distributed Hierarchical Storage Management settings

Modifies the Distributed Hierarchical Storage Management (DHSM) settings.


Format

```
/net/nas/dhsm -server <value> set [-state {Disabled | Enabled}] [[-username <value>] {-  
passwd <value> | -passwdSecure}] [-enableHTTPS {yes|no}]
```

Object qualifier

Qualifier	Description
-server	Type the ID of the associated NAS server

Action qualifier

Qualifier	Description
-state	Specifies whether the DHSM service is enabled. Possible values include: <ul style="list-style-type: none">• Disabled — DHSM service is disabled.• Enabled — DHSM service is enabled.
-username	Specifies the DHSM user name.
-passwd	Specifies the DHSM user password.  NOTE: This attribute is mandatory if the current state is being changed from Disabled to EnabledPerHost or EnabledForAll.
-passwdSecure	Specifies the password in secure mode. The user is prompted to specify the password and confirm the password.
-enableHTTPS	Specifies whether SSL (HTTPS) is required for DHSM requests to this DHSM server. Valid values are: <ul style="list-style-type: none">• yes• no

Example

The following command changes the DHSM password:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /net/nas/dhsm -server nas_0 set -state Enabled -username newname -passwd newpassword
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

Operation completed successfully.
```

Manage DHSM Connection

Distributed Hierarchical Storage Management (DHSM) connection is required for the Cloud Tiering Appliance (CTA) integration with Unity. The DHSM connection feature allows Unity file system data to be archived to CTA and recalled from CTA.

The following table lists the attributes for DHSM connection.

Table 64. DHSM connection attributes

Attribute	Description
ID	DHSM connection identifier.
Secondary URL	Specifies the protocol (HTTP) and the host name of the secondary storage server. It optionally specifies a portion of the hierarchical namespace published by the web server. While both an IP address and fully qualified domain name (FQDN) are allowed to specify as the host name, it is recommended to use FQDN.
Secondary port	Port of the secondary storage server.
Local port	Local port of the DHSM connections.
Secondary username	Username that the storage array uses if HTTP digest authentication is required by the secondary storage.
Timeout	Timeout in seconds when the connection is established to the secondary storage. If recall does not return within the timeout period specified, the NAS server tries another DHSM connection. Default value is 30 seconds.
File system	File system storage resource on which the connection is created.
Mode	Mode of the connection. Valid values are: <ul style="list-style-type: none">• Disabled – cannot create stub files or migrate data. Data currently on the NAS server can be read and written to.• Enabled (default) – allows both the creation of stub files and data migration through reads and writes.• Recall only – the policy engine is not allowed to create stub files, but the user is still able to trigger data migration by using a read or write request from the secondary file system to Unity.
Read policy	Read policy when the NAS server recalls data from the secondary storage. <ul style="list-style-type: none">• Full – recalls the whole file to the NAS server on a read request before the data is returned.• Passthrough – retrieves data without recalling the data to Unity.• Partial – recalls only the data blocks required to satisfy the client read request.• None – uses the read method option specified in the stub file.

Create a DHSM connection

Create a DHSM connection by using the HTTP protocol between the specified primary file system of Unity and a secondary file system of CTA.

Format

```
/net/nas/dhsmconn create [-async] -fs <value> -secondaryUrl <value> [-secondaryPort <value>] [-localPort <value>] [-mode {enabled | disabled | recallOnly}] [-readPolicy {none | full | passthrough | partial}] [-secondaryUsername <value>] [-secondaryPassword <value>] [-timeout <value>]
```

Action qualifiers

Qualifier	Description
-fs	Specifies the file system storage resource ID.
-secondaryUrl	Specifies the URL of the remote secondary storage, including the protocol, the host name and optionally a portion of the published hierarchical namespace.
-secondaryPort	Specifies the remote port number that the nas server delivers the HTTP request to. If not specified, the Data Mover issues HTTP requests to port 80 on the secondary storage HTTP server.
-localPort	Specifies the local port of the DHSM connection.
-mode	Sets the mode of Unity DHSM operations on the specified file system. Valid values are: <ul style="list-style-type: none">• enabled (default) – allows both the creation of stub files and data migration through reads and writes• disabled – neither stub files nor data migration is possible. Data currently on the Unity can be read and written to in the disabled mode.• recallOnly – the policy engine is not allowed to create stub files, but the user is still able to trigger data migration using a read or write request from the secondary file system to the Unity.
-readPolicy	Specifies the migration method option used by the Unity in the connection level, to override the migration method specified in the stub file. Valid values are: <ul style="list-style-type: none">• none (default) – specifies no override.• full – recalls the whole file to Unity on a read request before the data is returned.• passthrough – retrieves data without recalling the data to Unity.• partial – recalls only the blocks required to satisfy the client read request.
-secondaryUsername	Defines the username the HTTP client uses if digest authentication is required by the secondary storage HTTP server.
-secondaryPassword	Specifies the password associated with the username required by the secondary storage server.
-timeout	Specifies the timeout value in seconds. By default, the Unity HTTP client waits 30 seconds for a reply from the HTTP server and then retries the operation once.

Example

The following command creates an HTTP connection for file system "fs_1" to the secondary file system /export/dhsm1 on http://10.1.0.115.

```
uemcli /net/nas/dhsmconn create -filesystem fs_1 -secondaryUrl http://10.1.0.115/export/dhsm1
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection
```

```
ID = dhsmconn_1
Operation completed successfully.
```

View DHSM connection settings

View details for DHSM connections.

Format

```
/net/nas/dhsmconn [{-id <value> | -fs <value>}] show
```

Action qualifiers

Qualifier	Description
-id	DHSM connection identifier.
-fs	Specifies the file system storage resource ID.

Example 1

The following command shows all DHSM connections for file system "fs_1".

```
uemcli /net/nas/dhsmconn -fs fs_1 show
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

1:  ID                = dhsmconn_0
    File system       = fs_1
    Mode              = enabled
    Read policy       = none
    Secondary url      = http://172.24.102.115/export/dhsm1
    Secondary port     = 80
    Secondary username = admin
    Local port        = 80
    Timeout           = 60
```

Example 2

The following command shows DHSM connection "dhsmconn_1".

```
uemcli /net/nas/dhsmconn -id dhsmconn_1 show
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

1:  ID                = dhsmconn_1
    File system       = fs_1
    Mode              = disabled
    Read policy       = full
    Secondary url      = http://www.myserver.com/export/dhsm1
    Secondary port     = 80
    Secondary username = admin
    Local port        = 80
    Timeout           = 60
```

Example 3

The following command shows all DHSM connections on the storage system.

```
uemcli /net/nas/dhsmconn show
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

1:  ID                = dhsmconn_0
```

```

File system      = fs_1
Mode             = enabled
Read policy      = none
Secondary url     = http://10.1.0.115/export/dhsm1
Secondary port    = 80
Secondary username = admin
Local port       = 80
Timeout          = 60

2: ID            = dhsmconn_1
File system      = fs_2
Mode             = disabled
Read policy      = full
Secondary url     = http://10.1.0.115/export/dhsm1
Secondary port    = 80
Secondary username = admin
Local port       = 80
Timeout          = 60

3: ID            = dhsmconn_2
File system      = fs_3
Mode             = enabled
Read policy      = passthrough
Secondary url     = http://10.1.0.115/export/dhsm2
Secondary port    = 80
Secondary username = admin
Local port       = 80
Timeout          = 60

```

Change DHSM connection settings

Modify settings for an existing DHSM connection.

Format

```

/net/nas/dhsmconn -id <value> modify [-async] [-mode {enabled | disabled | recallOnly}]
[-readPolicy {full | passthrough | partial | none}] [-secondaryServerName <value> [-
secondaryPort <value>] [-localPort <value>] [-secondaryUsername <value> -secondaryPassword
<value>] [-timeout <value>]

```

Action qualifiers

Qualifier	Description
-id	DHSM connection identifier.
-mode	Sets the mode of Unity DHSM operations on the specified file system. Valid values are: <ul style="list-style-type: none"> enabled (default) – allows both the creation of stub files and data migration through reads and writes disabled – neither stub files nor data migration is possible. Data currently on the Unity can be read and written to in the disabled mode. recallOnly – the policy engine is not allowed to create stub files, but the user is still able to trigger data migration using a read or write request from the secondary file system to the Unity.
-readPolicy	Specifies the migration method option used by the Unity in the connection level, to override the migration method specified in the stub file. Valid values are: <ul style="list-style-type: none"> none (default) – specifies no override. full – recalls the whole file to Unity on a read request before the data is returned. passthrough – retrieves data without recalling the data to Unity. partial – recalls only the blocks required to satisfy the client read request.
-secondaryServerName	Specifies the remote server name or IP address.

Qualifier	Description
-secondaryPort	Specifies the remote port number that the NAS server delivers the HTTP request to. If not specified, the NAS server issues HTTP requests to port 80 on the secondary storage HTTP server.
-secondaryUsername	Defines the username the HTTP client uses if digest authentication is required by the secondary storage HTTP server.
-secondaryPassword	Specifies the password associated with the username required by the secondary storage server.
-timeout	Specifies the timeout value in seconds. By default, the Unity HTTP client waits 30 seconds for a reply from the HTTP server and then retries the operation once.

Example 1

The following command modifies the mode of connection "dhsmconn_1".

```
uemcli /net/nas/dhsmconn -id dhsmconn_1 modify -mode recallOnly
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTP connection

ID = dhsmconn_1
Operation completed successfully.
```

Example 2

The following command modifies the readPolicy setting for connection "dhsmconn_1".

```
uemcli /net/nas/dhsmconn -id dhsmconn_1 modify -readPolicy passthrough
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTP connection

ID = dhsmconn_1
Operation completed successfully.
```

Delete a DHSM connection

Deletes an existing HTTP connection between the file system and the secondary file system.

Format

```
/net/nas/dhsmconn -id <value> delete [-async] [-recallPolicyOnDelete {fail | no | yes}]
```

Action qualifiers

Qualifier	Description
-id	DHSM connection identifier.
-recallPolicyOnDelete	Specifies the recall policy for any migrated file during the delete operation. Valid values are: <ul style="list-style-type: none"> <code>fail</code> (default) – scans the file system for stub files that depend on the connection and fails on the first one. <code>no</code> – deletes the connection without checking for stub files that depend on the connection. If the <code>no</code> option is specified and stub files exist, an I/O error appears when the file is read because the connection no longer exists.

Qualifier	Description
	<ul style="list-style-type: none"> yes – migrates the files back to Unity before the connection is deleted.

Example

The following command deletes the DHSM connection "dhsmconn_1" and specifies the recall policy for any migrated files during the delete operation.

```
uemcli /net/nas/dhsmconn -id dhsmconn_1 delete -recallPolicy no
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTP connection

Operation completed successfully.
```

Manage the tie breaker node (dual-SP virtual deployments only)

Using a Tie Breaker Node (TBN) can increase the availability of your storage system. To enable a TBN, see [Change tie breaker node configuration settings](#) on page 225

Table 65. TBN configuration attributes

Attribute	Description
ID	TBN identifier.
Health state	<p>Health state of the TBN. The health state code appears in parentheses. Value is one of the following:</p> <ul style="list-style-type: none"> Unknown (0) —The health of the TBN cannot be determined. OK (5) —TBN is operating normally. Degraded/Warning (10) —TBN service is working, but one or more of the following may have occurred: <ul style="list-style-type: none"> TBN can communicate with SPA through one network heartbeat link, but not both. One network heartbeat link between them is disconnected. TBN can communicate with SPB through one network heartbeat link, but not both. One network heartbeat link between them is disconnected. TBN can communicate with each SP through one network heartbeat link separately, but through not both heartbeat links. One network heartbeat link between the TBN and SPA is disconnected. One heartbeat link between the TBN and SPB is also disconnected. Minor failure (15) —One or of the following occurred: <ul style="list-style-type: none"> TBN is disconnected from SPA. Both network heartbeat links between the TBN and SPA are disconnected. TBN is disconnected from SPB. Both network heartbeat links between the TBN and SPB are disconnected. Major failure (20) —TBN is disconnected from SPA and SPB. All network heartbeat links between the TBN and SPA, and the TBN and SPB are disconnected.

Table 65. TBN configuration attributes (continued)

Attribute	Description
Health details	Additional health information. See Appendix A, Reference, for health information details.
Active	Indicates whether the TBN service is active. Valid values are: <ul style="list-style-type: none">• yes• no

View basic tie breaker node information

Display basic Tie Breaker Node (TBN) information, including the TBN identifier and health state for an active TBN.

Format

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

Example

The following command shows basic TBN information:

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

```
Storage system address: 10.64.75.201
Storage system port: 443
HTTPS connection

1:      ID                = 42389FCA-01D1-4491-7D77-8060373D67B8
      Health state      = OK (5)
      Active            = yes
```

Manage a tie breaker node configuration (dual-SP virtual deployments only)

A Tie Breaker Node (TBN) enables a dual-SP UnityVSA to prevent data corruption resulting from a "split-brain" situation, which occurs when the two SPs stop communicating and synchronizing their data with each other. Enabling a TBN prevents this situation and can increase the availability of your storage system.

Table 66. TBN configuration attributes

Attribute	Description
Enabled	Indicates whether the TBN is enabled. Valid values are: <ul style="list-style-type: none">• yes• no
Active TBN	TBN identifier.

View tie breaker node configuration settings

View details about Tie Breaker Node (TBN) configuration settings.

Format

```
/net/tbn/config show
```

Example

The following command shows details for the TBN configuration:

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

Storage system address: 10.64.75.201
Storage system port: 443
HTTPS connection

1:      Enabled                               = yes
      Active TBN                             = 42389FCA-01D1-4491-7D77-8060373D67B8
```

Change tie breaker node configuration settings

Modify the Tie Breaker Node (TBN) configuration.

Format

```
/net/tbn/config set [-enabled {yes|no}] [-activeTbn <value>]
```

Action qualifier

Qualifier	Description
-enabled	Enable or disable a TBN. Valid values are: <ul style="list-style-type: none">• yes• no
-activeTbn	Specify the TBN identifier: <ul style="list-style-type: none">• Use this value with the -enabled qualifier to enable the specified TBN.• Use this value without the -enabled qualifier to activate the specified TBN. The TBN identifier is not needed when the value of the -enabled qualifier is no.

Example 1: Enable a TBN

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /net/tbn/config set -enabled yes -
activeTbn 42389FCA-01D1-4491-7D77-8060373D67B8

Storage system address: 10.64.75.201
Storage system port: 443
HTTPS connection

Operation completed successfully.
```

Example 2: Disable a TBN

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /net/tbn/config set -enabled no

Storage system address: 10.64.75.201
Storage system port: 443
HTTPS connection

Operation completed successfully
```

Example 3: Change the active TBN

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /net/tbn/config set -activeTbn  
42389FCA-01D1-4491-7D77-8060373D67B8
```

```
Storage system address: 10.64.75.201  
Storage system port: 443  
HTTPS connection
```

```
Operation completed successfully
```

Manage Hosts

This chapter contains the following topics:

Topics:

- [Manage host configurations](#)
- [Manage host LUNs](#)
- [Manage host initiators](#)
- [Manage host initiator paths](#)
- [Manage iSCSI CHAP accounts for one-way CHAP authentication](#)
- [Manage iSCSI connections](#)
- [Manage iSCSI connection paths](#)
- [Manage remote storage systems](#)
- [Manage VMware vCenter](#)
- [Manage ESXi hosts](#)
- [Virtual machine](#)
- [VM hard disk](#)

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 subnet (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.

Each host configuration is identified by an ID.

The following table lists the attributes for host configurations.

Table 67. Host configuration attributes


Attribute	Description
ID	ID of the host configuration.
Name	Name of the host configuration.
Description	Brief description of the host configuration.
Tenant	Tenant with which the host is associated.
Address	Hostname or IP address associated with the host, IP address of the subnet, or name of the netgroup.  NOTE: This information is required when connecting hosts to network shares on the system.
Netmask	Subnet mask for the host.
Type	Type of host configuration. Value is one of the following: <ul style="list-style-type: none"> • <code>host</code> — A host defines and controls access to storage resources on a host-by-host basis.

Table 67. Host configuration attributes (continued)

Attribute	Description
	<ul style="list-style-type: none"> <code>subnet</code> — 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. You can associate a host configuration with a subnet mask to define and control storage access for hosts on a particular network segment. <code>netgroup</code> — 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. 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. <p>NOTE: Typically, netgroups are accessible only through NIS. If NIS is not running, netgroups are not defined. Manage NIS server domains on page 201 explains how to configure NIS server communication.</p>
<code>OS type</code>	<p>Type of operating system (OS) running on the host. You can enter any value you want. Here are suggestions for some of the common operating systems:</p> <ul style="list-style-type: none"> <code>undefined</code> — OS is not specified (default) or unknown. <code>other</code> — Other. <code>win2003srv</code> — Windows Server 2003. <code>winxp</code> — Windows XP. <code>win2008srv</code> — Windows Server 2008. <code>winvista</code> — Windows Vista. <code>win2012srv</code> — Windows Server 2012. <code>esx</code> — VMware ESX. <code>redhat</code> — Red Hat Enterprise Linux. <code>sles</code> — SUSE Linux Enterprise. <code>win7</code> — Windows 7. <code>hyperv</code> — Microsoft Hyper-V. <code>solaris</code> — Solaris.
<code>Ignored address</code>	A comma-separated list of host IP addresses to exclude from data access.
<code>Health state</code>	<p>Health state of the host. The health state code appears in parentheses. Value is one of the following:</p> <ul style="list-style-type: none"> <code>Unknown (0)</code> — Status is unknown. <code>OK (5)</code> — Working correctly. <code>OK BUT (7)</code> — Working correctly, but there could be a problem. <code>Degraded/Warning (10)</code> — Working and performing all functions, but the performance may not be optimum. <code>Minor failure (15)</code> — 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. <code>Major failure (20)</code> — 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. <code>Critical failure (25)</code> — Failed and recovery may not be possible. This condition has resulted in data loss and should be remedied immediately. <code>Non-recoverable error (30)</code> — Completely failed and cannot be recovered.
<code>Health details</code>	Additional health information. See Appendix A, Reference, for health information details.
<code>Management type</code>	<p>Indicates the way the host is managed. Value is one of the following:</p> <ul style="list-style-type: none"> <code>VMware</code> — The host is managed through VMware web services. <code>Other</code> — The host is automatically created on the storage system. <code>Manual</code> — The host is created manually.

Table 67. Host configuration attributes (continued)

Attribute	Description
Accessible LUNs	A comma-separated list of LUNs that are accessible to the host.
Host LUN IDs	Comma-separated list of HLUs (Host LUN identifiers), which the corresponding hosts use to access the LUN.

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>] [-tenant <value>] -type {host [-addr <value>] [-ignoredAddr <value>] [-osType <value> ] | subnet -addr <value> [-netmask <value>] | netgroup -addr <value>}
```

Action qualifier

Qualifier	Description
-name	Specifies the name of the host configuration.
-descr	Specifies a brief description of the host configuration.
-type	<p>Specifies the type of host configuration. Value is one of the following:</p> <ul style="list-style-type: none"> • host — A host defines and controls access to storage resources on a host-by-host basis. • 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. <p>You can associate a host configuration with a subnet mask to define and control storage access for hosts on a particular network segment.</p> <ul style="list-style-type: none"> • 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. <p>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.</p> <p>NOTE: Typically, netgroups are only accessible through NIS. If NIS is not running, netgroups are not defined. Manage NIS server domains on page 201 explains how to configure NIS server communication.</p>
-tenant	<p>Specifies the identifier of the tenant with which the host is to be associated.</p> <p>NOTE: If not specified, the host is created in the default network namespace and the tenant attribute will be blank.</p>
-addr	<p>Specifies the hostnames or IP addresses associated with the host, IP addresses of the subnet, or the name of the netgroup. Separate each value with a comma.</p> <ul style="list-style-type: none"> • Format: <IP address>/[<prefix length>]. • Default prefix length for IPv4 addresses is 24 and for IPv6 addresses is 64. <p>NOTE: This information is required when connecting hosts to network shares on the system.</p>
-ignoredAddr	Specifies a list of IP addresses associated with the host that are excluded from data access. Separate each value with a comma.
-netmask	Specifies the subnet mask for the host configuration.
-osType	Specify the type of operating system (OS) running on the host. You can enter any value you want. Here are suggestions for some of the common operating systems:

Qualifier	Description
	<ul style="list-style-type: none"> • <code>undefined</code> — OS is not specified (default) or unknown. • <code>other</code> — Other. • <code>win2003srv</code> — Windows Server 2003. • <code>winxp</code> — Windows XP. • <code>win2008srv</code> — Windows Server 2008. • <code>winvista</code> — Windows Vista. • <code>win2012srv</code> — Windows Server 2012. • <code>esx</code> — VMware ESX. • <code>redhat</code> — Red Hat Enterprise Linux. • <code>sles</code> — SUSE Linux Enterprise. • <code>win7</code> — Windows 7. • <code>hyperv</code> — Microsoft Hyper-V. • <code>solaris</code> — Solaris.

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 Host_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
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

ID = Host_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 Subnet_1015:

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

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

ID = Subnet_1015
Operation completed successfully.
```

Example 3

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

- Name is IPv6Subnet.
- Description is "V6_HE_Subnet".
- IPv6 address is 2001:db8:c25:
- Prefix length is 48.

The host configuration receives ID NetGroup_1023:

```
uemcli -d 10.0.0.1 /remote/host create -name IPv6Subnet -descr "V6_HE_Subnet" -type subnet
-addr 2001:db8:c25::/48
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

ID = NetGroup_1023
Operation completed successfully.
```

View host configurations

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

 **NOTE:** The `show action command` on page 21 explains how to change the output format.

Format

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

Object qualifier

Qualifier	Description
-id	Specify the host ID.
-name	Specify the host name.
-type	Specifies the host type. Valid values are: <ul style="list-style-type: none"> • host • subnet • 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 -brief
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

1:      ID           = 1014
        Name         = MyHost
        Description   = this is my host
        Tenant        = tenant_3
        Type          = host
        Address        = 10.64.74.10, 10.64.80.10
        Netmask        =
        OS type        = winxp
        Ignored address = 10.64.80.10
        Health state   = OK (5)

2:      ID           = 1015
```

```
Name           = MySubnet
Description     = this is my subnet
Tenant         =
Type           = subnet
Address        = 192.168.10.0
Netmask        = 255.255.255.0
OS type        =
Ignored address =
Health state    = OK (5)
```

Change host configuration settings

Change the settings for a host configuration.


Format

```
/remote/host {-id <value> | -name <value>} set [-name <value>] [-descr <value>] [-addr <value>] [-ignoredAddr <value>] [-netmask <value>] [-osType <value>] [-addLuns <value>] [-hplus <value>] [-removeLuns <value>]
```

Object qualifier

Qualifier	Description
-id	ID of the host configuration to change.
-name	Name of the host configuration to change.

Action qualifier

Qualifier	Description
-name	Specifies the new name for the host configuration.
-desc	Specifies the new description of the host configuration.
-addr	<p>Specifies 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.</p> <ul style="list-style-type: none">For subnet type, specifies the new IP address of the subnet.For netgroup, specifies the new netgroup's name.Format: <IP address>/[<prefix length>].Default prefix length for IPv4 addresses is 24 and for IPv6 addresses is 64. <p> NOTE: This information is required when connecting hosts to network shares on the system.</p>
-ignoredAddr	Specifies a list of IP addresses associated with the host that are excluded from data access. Separate each value with a comma.
-netmask	Specify the subnet mask for the host configuration.
-osType	<p>Specify the type of operating system (OS) running on the host. You can enter any value you want. Here are suggestions for some of the common operating systems:</p> <ul style="list-style-type: none">undefined — OS is not specified or unknown.other — Other.win2003srv — Windows Server 2003.winxp — Windows XP.win2008srv — Windows Server 2008.winvista — Windows Vista.win2012srv — Windows Server 2012.

Qualifier	Description
	<ul style="list-style-type: none"> • <code>esx</code> — VMware ESX. • <code>redhat</code> — Red Hat Enterprise Linux. • <code>sles</code> — SUSE Linux Enterprise. • <code>win7</code> — Windows 7. • <code>hyperv</code> — Microsoft Hyper-V. • <code>solaris</code> — Solaris.
<code>-addLuns</code>	Specify a comma-separated list of LUN friendly IDs for LUNs to add to the host.
<code>-hlus</code>	<p>Specifies the comma-separated list of Host LUN identifiers to be used by the corresponding hosts which were specified in the <code>-lunHosts</code> option. The number of items in the two lists must match. However, an empty string is a valid value for any element of the Host LUN identifiers list, as long as commas separate the list elements. Such an empty element signifies that the system should automatically assign the Host LUN identifier value by which the corresponding host will access the LUN.</p> <p>If not specified, the system will automatically assign the Host LUN identifier value for every host specified in the <code>-lunHosts</code> argument list.</p>
<code>-removeLuns</code>	Specify a comma-separated list of LUN friendly IDs for LUNs to remove from the host.

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
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection
```

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

Delete host configurations

Delete a host configuration.

i **NOTE:** Deleting a host configuration breaks the block-based (Fibre Channel or iSCSI) 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> | -name <value>} delete
```

Object qualifier

Qualifier	Description
<code>-id</code>	ID of the host configuration to delete.
<code>-name</code>	Name 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
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection
```

```
Operation completed successfully.
```

Manage host LUNs

Host LUNs are the storage resources that belong to the hosts connected to the storage system.

There are two types of host LUNs:

- Production LUNs— Read/write LUNs used for data access.
- Snapshot LUNs — Read-only and read/write snapshots of a production LUN.

Each host LUN is identified by an ID.

The following table lists the attributes for host LUNs.

Table 68. Host LUN attributes

Attribute	Description
ID	Unique identifier of the host LUN (HLU).
Host	ID of the host that owns the LUN.
Host name	Name of the host that owns the LUN.
LUN	Friendly ID of the LUN.
LUN name	LUN name.
Snapshot	Snapshot ID of a LUN or consistency group.
Snapshot name	Snapshot name of a LUN or consistency group.
LUN ID	Logical unit number on the host, or the host LUN ID.
Access	Access permission for the host. Valid values are: <ul style="list-style-type: none">• read-only• read/write
LUN type	LUN type. Valid values are: <ul style="list-style-type: none">• snap• production

View host LUN configurations

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

 **NOTE:** The `show action command` on page 21 explains how to change the output format.

Format

```
/remote/host/hlu { -id <value> | -host <value> | -hostName <value> | -lun <value> |
-lunName <value> | { -host <value> | -hostName <value> } { -lun <value> | -lunName
<value> } } [-type { production | snap } ] show
```

Object qualifier

Qualifier	Description
-id	Specifies the host LUN ID.
-host	Specifies the host ID.
-hostName	Specifies the host name.
-lun	Specifies the LUN ID.
-lunName	Specifies the LUN name.
-type	Specifies the LUN type.

Example

The following command lists all host LUNs on host Host_3:


```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /remote/host/hlu -host Host_3 show -detail
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

1:   ID           = Host_3_sv_2_prod
     Host         = Host_3
     Host name    = 10.0.0.2
     LUN          = sv_2
     LUN name     = joeslun
     Snapshot     =
     Snapshot name =
     LUN ID       = 1
     Access       = Read/write
     LUN type     = Production
```

Change host LUN configuration settings

Change the host LUN ID.

 **NOTE:** This operation will fail if you try to assign a LUN ID that is already in use.

Format

```
/remote/host/hlu {-id <value>} set -lunid <value>
```

Object qualifier

Qualifier	Description
-id	Specifies the HLU.

Action qualifier

Qualifier	Description
-lunid	Specifies the new LUN ID for the LUN on the selected host.

Example

The following command changes the ID `Host_3_sv_2_prod` to LUN 0:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /remote/host/hlu -id Host_3_sv_2_prod set -lunid 0
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

Operation completed successfully.
```

Manage host initiators

After you create a host configuration for controlling host access to storage on the system, you need to create one or more initiators for each host configuration that accesses the storage system. Each initiator represents the initiator on the host, which will connect to the storage system. There are two types of initiators, Fibre Channel (FC) and iSCSI.

A FC initiator contains the WWN of an HBA on the host. This WWN is not the WWN of the host.

An iSCSI initiator contains the IQN (iSCSI Qualified Name) used by the host, and optionally the CHAP authentication password associated with the host. [Manage reverse CHAP for mutual CHAP authentication](#) on page 162 explains how to configure reverse (two-way) CHAP authentication on the system.

Each initiator is identified by an ID.

The following table lists the attributes for initiators.

Table 69. Initiator attributes

Attribute	Description
ID	Host initiator ID.
Host	Name of the parent host.
UID	FC WWN or iSCSI IQN of the initiator.
Initiator type	The type of initiator. Value is one of the following: <ul style="list-style-type: none">• FC• iSCSI
Ports logged in	Comma-separated list of array target ports that the initiator is logged into.
Ignored	Indicates whether the initiator is ignored for data access to the host. Value is one of the following: <ul style="list-style-type: none">• Yes — The initiator is ignored.• No — The initiator is not ignored.
Health state	Health state of the system. The health state code appears in parentheses. Value is one of the following: <ul style="list-style-type: none">• Unknown (0) — Status is unknown.• OK (5) — 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.

Table 69. Initiator attributes (continued)

Attribute	Description
	<ul style="list-style-type: none"> Non-recoverable error (30) — Completely failed and cannot be recovered.
Health details	Additional health information. See Appendix A, Reference, for health information details.
CHAP users	List of CHAP accounts configured for the initiator.
Source type	<p>The source initiator type. Values are:</p> <ul style="list-style-type: none"> HPAutotrespass - HP with Auto-trespass OpenNative (default) - Open native (such as CLARiiON Open) SGI - Silicon Graphics HPNoAutotrespass - HP without Auto-trespass Dell FujitsuSiemens Tru64- Compaq Tru64
Failover mode	<p>The failover mode for the initiator. Values are:</p> <ul style="list-style-type: none"> AutoTrespass- Any media access to the non owning SP is rejected. PassiveNotReady- A command failure during I/O is sent to the non-owning SP. DMP- Quiet trespass on I/O to non owning SP. PassiveAlwaysReady- Some commands, e.g. Test Unit Ready, returns PAR status. ALUA(default) - Initiators are permitted to send I/O to a LUN regardless of which SP actually owns the LUN.
LUNZ enabled	<p>Specifies whether LUNZ is enabled. Values are:</p> <ul style="list-style-type: none"> yes no
Unit serial number	<p>Indicates the unity serial number. Values are:</p> <ul style="list-style-type: none"> Array (default) LUN <p>For SCSI-3 interfaces, the Unity Serial Number page (Vital Product Data page 0x80) reports the serial number for the array or LUN.</p>

Create initiators

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

Format

```
/remote/initiator create -host <value> -uid <value> -type {iscsi|fc} [-sourceType
{HPAutotrespass | OpenNative | SGI | HPNoAutotrespass | Dell | FujitsuSiemens | Tru64}]
[-failoverMode {AutoTrespass | PassiveNotReady | DMP | PassiveAlwaysReady | ALUA}] [-
lunzEnabled {yes | no}] [-unitSerialNumber {Array | LUN}]
```

Object qualifier

Qualifier	Description
-host	Identifies the host configuration to which to assign the initiator. View host configurations on page 231 explains how to view the IDs of host configurations on the system.
-uid	Specifies the FC WWN or the iSCSI IQN of the host to which to assign the initiator.
-type	<p>Specifies the type of initiator. Value is one of the following:</p> <ul style="list-style-type: none"> iscsi

Qualifier	Description
	<ul style="list-style-type: none"> • <code>fc</code>
<code>-sourceType</code>	Specify the source type for the initiator. Valid values are: <ul style="list-style-type: none"> • <code>HPAutotrespass</code> - HP with Auto-trespass • <code>OpenNative</code> (default) - Open native (such as CLARiON Open) • <code>SIG</code> - Silicon Graphics • <code>HPNoAutotrespass</code> - HP without Auto-trespass • <code>Dell</code> • <code>FujitsuSiemens</code> • <code>Tru64</code> - Compaq Tru64
<code>-failoverMode</code>	Specify the failover mode for the initiator. Valid values are: <ul style="list-style-type: none"> • <code>AutoTrespass</code> - Any media access to the non owning SP is rejected. • <code>PassiveNotReady</code> - A command failure during I/O is sent to the non-owning SP. • <code>DMP</code> - Quiet trespass on I/O to non owning SP. • <code>PassiveAlwaysReady</code> - Some commands, e.g. Test Unit Ready, returns PAR status. • <code>ALUA</code> (default) - Initiators are permitted to send I/O to a LUN regardless of which SP actually owns the LUN.
<code>-lunzEnabled</code>	Set whether LUNZ will be enabled. Valid values are: <ul style="list-style-type: none"> • <code>yes</code> (default) • <code>no</code>
<code>-unitSerialNumber</code>	Specify the Unit Serial Number. Valid values are: <ul style="list-style-type: none"> • <code>Array</code> (default) • <code>LUN</code> <p>For SCSI-3 interfaces, the Unity Serial Number page (Vital Product Data page 0x80) reports the serial number for the array or LUN.</p>

Example 1

The following command creates an FC initiator for host configuration 1014. The FC initiator receives ID 1021:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /remote/initiator create -host 1014 -uid "20:00:00:00:C9:29:0F:FD:10:00:00:00:C9:29:0F:FD" -type fc
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection
```

```
ID = 1021
Operation completed successfully.
```

Example 2

The following command creates an iSCSI initiator for host configuration Host_3. The iSCSI initiator receives ID 1022:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! -sslPolicy accept /remote/initiator create -host Host_3 iqn.1000-05.com.fancy:win-123456 -type iscsi
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection
```

```
ID = 1022
Operation completed successfully.
```

Example 3

The following command creates an iSCSI initiator for "Host_3" with:

- A source type of "OpenNative"
- A failover mode of "PassiveAlwaysReady"
- LUNZ disabled
- And an "Array" Unit Serial Number

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /remote/initiator create -host Host_3 -uid iqn.1993-08.com.microsoft:win -type iscsi -sourceType OpenNative -failoverMode PassiveAlwaysReady -lunzEnabled no -unitSerialNumber Array
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

ID = HostInitiator_8
Operation completed successfully.
```

View initiators

View a list of initiators. You can filter on the initiator ID, host ID, or whether the initiator is registered.

Format

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

Object qualifier

Qualifier	Description
-id	Identifies the initiator.
-host	Type the ID of a host configuration to view the initiators assigned to the host configuration.
-unregistered	Specifies unregistered initiators.

Example

The following command lists the details of all initiators on the system:

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

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

1: ID                = HostInitiator_7
   Host              = Host_4
   UID               = iqn.1991-05.com.microsoft:cnenfanw411c.corp.emc.com
   Initiator type    = iscsi
   Ports logged in   = spb_eth2,spa_eth2
   Ignored           = no
   Health State      = OK (5)
   Health Details    = "The component is operating normally. No action is required."
   CHAP users        =
   Source type       = Open_Native
   Failover mode     = ALUA
   LUNZ              = yes
   Unit serial number = Array
```

Change initiator settings

Modify an already created initiator.

Format

```
/remote/initiator -id <value> set [-ignored {yes | no}] [-host <value>] [-sourceType {HPAutotrespass | OpenNative | SGI | HPNoAutotrespass | Dell | FujitsuSiemens | Tru64}] [-failoverMode {AutoTrespass | PassiveNotReady | DMP | PassiveAlwaysReady | ALUA}] [-lunzEnabled {yes | no}] [-unitSerialNumber {Array | LUN}]
```

Object qualifier

Qualifier	Description
-id	Specifies the ID of the initiator

Action qualifier

Qualifier	Description
-ignored	Specifies whether the initiator is ignored for data access to the host. Valid values are: <ul style="list-style-type: none">yes — The initiator is ignored.no — The initiator is not ignored.
-host	Identifies the host configuration to which the initiator is assigned. View host configurations on page 231 explains how to view the IDs of host configurations on the system.
-sourceType	Specify the source type for the initiator. Valid values are: <ul style="list-style-type: none">HPAutotrespass — HP with Auto-trespassOpenNative — Open native (such as CLARiiON Open)SGI — Silicon GraphicsHPNoAutotrespass — HP without Auto-trespassDellFujitsuSiemensTru64 — Compaq Tru64
-failoverMode	Specify the failover mode for the initiator. Valid values are: <ul style="list-style-type: none">AutoTrespass — Any media access to the non owning SP is rejected.PassiveNotReady — A command failure during I/O is sent to the non-owning SP.DMP — Quiet trespass on I/O to non owning SP.PassiveAlwaysReady — Some commands, e.g. Test Unit Ready, returns PAR status.ALUA — Initiators are permitted to send I/O to a LUN regardless of which SP actually owns the LUN.
-lunzEnabled	Set whether LUNZ will be enabled. Valid values are: <ul style="list-style-type: none">yesno
-unitSerialNumber	Specify the Unit Serial Number. Valid values are: <ul style="list-style-type: none">ArrayLUN For SCSI-3 interfaces, the Unity Serial Number page (Vital Product Data page 0x80) reports the serial number for the array or LUN.
-force	Specify to bypass the validation of setting a new host when there are already storage resources associated with the host and attached to the initiator.

Qualifier	Description
	If you want to delete a stale initiator for which the associated host has LUN access and as such those LUNs cannot be deleted, you will need to ignore the associated host by setting the stale initiator to an empty host with this <code>-force</code> option.

Example

The following command changes the source type, failover mode, LUNZ settings, and Unit Serial Number of the initiator:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /remote/initiator -id HostInitiator_6 set
-sourceType HPAutotrespass -failoverMode PassiveNotReady -lunzEnabled yes -unitSerialNumber
Array
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

Operation completed successfully.
```

Manage host initiator paths

The storage system communicates with a host initiator over a host initiator path. The storage system uses this path to identify the host initiator configuration information.

The following table lists the attributes for a host initiator path.

Table 70. Initiator path attributes

Attribute	Description
Initiator	Parent initiator.
Port	The ID of the target port.
Logged in	Indicates whether the initiator path is logged in. Value is one of the following: <ul style="list-style-type: none"> Yes No
Host	The host ID to which the initiator path is registered. No value in this field means the initiator is not registered to a host. <p>NOTE: This host ID may be different from that of the initiator when auto-push registration and initiator registration information are not the same. This causes the storage system to generate an alert.</p>
Registration method	Indicates how the initiator path is registered. Value is one of the following: <ul style="list-style-type: none"> Unknown — The initiator was registered by a method other than ESX push. ESX — ESX pushed the initiator registration to the storage system.
Session IDs	Comma-separated list of the session IDs for this path.
Health state	Health state of the system. The health state code appears in parentheses. Value is one of the following: <ul style="list-style-type: none"> Unknown (0) — Status is unknown. OK (5) — Working correctly. OK BUT (7) — Working correctly, but there could be a problem.

Table 70. Initiator path attributes (continued)

Attribute	Description
	<ul style="list-style-type: none">• 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.
Health details	Additional health information. See Health details on page 570, for health information details.

View initiator paths

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

 **NOTE:** The [show action command](#) on page 21 explains how to change the output format.

Format

```
/remote/initiator/path [-initiator <value>] show
```

Object qualifier

Qualifier	Description
-initiator	Type the ID of the initiator to display the paths associated with it.

Example

The following command lists all initiator paths on the system:

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

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

1:      Initiator          = 1043
        Port              = eth1_SPB
        Logged in         = Yes
        Registration method = ESX
        Host              = 1014
        Health state       = OK (5)
```

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 162 explains how to configure reverse CHAP authentication.

Each CHAP account is identified by an ID.

The following table lists the attributes for CHAP accounts.

Table 71. CHAP Account Attributes

Attribute	Description
ID	ID of the CHAP account.
IQN	IQN address of the host (initiator).
Wildcard	Whether this is wildcard CHAP, where all initiators can be authenticated by the storage system. Valid values are: <ul style="list-style-type: none">• <code>yes</code> — All initiators can be authenticated by the storage system.• <code>no</code> — Authentication is on a per initiator basis.
Username	CHAP username.
Secret	CHAP secret password.
Secret format	The CHAP input format. Valid values are: <ul style="list-style-type: none">• <code>ascii</code> — ASCII format• <code>hex</code> — Hexadecimal format

Create iSCSI CHAP accounts

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

Format

```
/remote/iscsi/chap create {-iqn <value> | -wildcard} [-username <value>] {-secret <value> | -secretSecure} [ -secretFormat { ascii | hex } ]
```

Object qualifier

Qualifier	Description
<code>-iqn</code>	Specifies the IQN address of the host (initiator).
<code>-wildcard</code>	Specifies whether this is a wildcard CHAP, where all initiators can be authenticated by the storage system.
<code>-username</code>	Specifies the CHAP username.
<code>-secret</code>	Specifies the CHAP secret password.
<code>-secretSecure</code>	Specifies the CHAP secret in secure mode - the user will be prompted to input the password.
<code>-secretFormat</code>	Specifies the CHAP input format. Valid values are:

Qualifier	Description
	<ul style="list-style-type: none"> • <code>ascii</code>(default) — ASCII format • <code>hex</code> — Hexadecimal format

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
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection
```

```
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 21 explains how to change the output format.

Format

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

Object qualifier

Qualifier	Description
<code>-id</code>	Identifies the 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
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection
```

```
1:      ID          = CHAP_1
      IQN          = iqn.1991-05.com.microsoft:cpc7745
      Wildcard     = no
      Username     = iqn.1991-05.com.microsoft:cpc7745
```

```
2:      ID          = CHAP_2
      IQN          =
      Wildcard     = yes
      Username     = globalChapUserName
```

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 [-username <value>]{-secret <value> | -secretSecure} [ -secretFormat { ascii | hex } ]
```

Object qualifier

Qualifier	Description
-id	Identifies the iSCSI CHAP account to change.

Action qualifier

Qualifier	Description
-username	Specifies the CHAP username.
-secret	Specifies the CHAP secret password.
-secretSecure	Specifies the CHAP secret in secure mode - the user will be prompted to input the password.
-secretFormat	Specifies the CHAP input format. Value is one of the following: <ul style="list-style-type: none">• <code>ascii</code> — ASCII format• <code>hex</code> — Hexadecimal format

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
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection
```

```
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
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

Operation completed successfully.
```

Manage iSCSI connections

Identifies iSCSI connections between destination SPs and arrays to the source system that are required to create iSCSI connection paths.

NOTE: Only one iSCSI connection can be created at a time. Therefore, only one source system can be managed for one migration operation. If a migration operation is already completed, you must create a new iSCSI connection with new paths.

The following table lists the attributes for iSCSI connections.

Table 72. iSCSI connection Attributes

Attribute	Description
ID	ID of the iSCSI connection.
Name	Name of the iSCSI connection.
Description	Description of the iSCSI connection.

Create an iSCSI connection

Create an iSCSI connection.

NOTE: Only one iSCSI connection can be created at a time. Therefore, only one source system can be managed for one migration operation. If a migration operation is already completed, you must create a new iSCSI connection with new paths.

Format

```
/remote/iscsi/connection create -name <value> [-descr <value>] [-async]
```

Action qualifiers

Qualifier	Description
-name	Specifies the iSCSI connection name.
-descr	Specifies the iSCSI connection description.
-async	Run the operation in asynchronous mode.

Example

The following command creates an iSCSI connection.

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /remote/iscsi/connection create -name myConn -descr "Connection for lun_1 importing"
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection
```

```
ID = iscsi_conn_1
Operation completed successfully.
```

View iSCSI connection settings

View details for existing iSCSI connections.

Format

```
/remote/iscsi/connection [{-id <value> | -name <value>}] show
```

Object qualifiers

Qualifier	Description
-id	Type the ID of the iSCSI connection.
-name	Type the unique name of the iSCSI connection.

Example

This example shows all iSCSI connections.

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

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection
```

```
1:      ID              = iscsi_conn_1
      Name              = Old Array
      Description       = LUN 1 import
```

Change iSCSI connection settings

Change the current iSCSI connection settings.

Format

```
/remote/iscsi/connection {-id <value> | -name <value>} set -descr <value> [-async]
```

Object qualifiers

Qualifier	Description
-id	Type the ID of the iSCSI connection.
-name	Type the unique name of the iSCSI connection.

Action qualifiers

Qualifier	Description
-descr	Type the iSCSI connection description.
-async	Run the operation in asynchronous mode.

Example

The following command changes the description for the iSCSI connection.


```
uemcli uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /remote/iscsi/connection -id iscsi_conn_1 set -descr copyconnection
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

Operation completed successfully.
```

Delete an iSCSI connection

Deletes an existing iSCSI connection.

 **NOTE:** When you delete an iSCSI connection, any iSCSI connection paths associated with the iSCSI connection are also deleted.

Format

```
/remote/iscsi/connection {-id <value> | -name <value>} delete [-async]
```

Object qualifiers

Qualifier	Description
-id	Type the ID of the iSCSI connection you want to delete.
-name	Type the unique name of the iSCSI connection you want to delete.

Action qualifier

Qualifier	Description
-async	Run the operation in asynchronous mode.

Example

The following command deletes the "iscsi_conn_1" iSCSI connection.

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /remote/iscsi/connection -id iscsi_conn_1 delete
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

Operation completed successfully.
```


Manage iSCSI connection paths

The connection iSCSI path to a remote system includes IP address, TCP port, and a list of iSCSI interfaces on the storage system from which outgoing iSCSI connections are established. An iSCSI connection can have one or more iSCSI paths configured.

NOTE: If the source system has an iSCSI address which contains CHAP credentials, you must remove the CHAP credentials from the iSCSI address before migration, and then restore the CHAP credentials once migration is complete.

The following table lists the attributes for iSCSI connection paths.

Table 73. iSCSI connection path Attributes

Attribute	Description
Index	Number of the iSCSI path within the iSCSI connection.
iSCSI connection	ID of the iSCSI connection.
iSCSI connection name	Name of the iSCSI connection.
iSCSI path description	Description of the iSCSI path.
Remote iSCSI address	IP address of the iSCSI destination on the remote system.
Remote iSCSI port	TCP port of the iSCSI destination on the remote system.
Local iSCSI interfaces	List of identifiers of the iSCSI interfaces on the local storage system.

Create an iSCSI connection path

Creates a new iSCSI path and adds it to a specified iSCSI connection.

Format

```
/remote/iscsi/connection/path create {-connection <value> | -connectionName <value>} [-  
descr <value>] -addr <value> [-port <value>] -if <value> [-async]
```

Action qualifiers

Qualifier	Description
-connection	Type the ID of the iSCSI connection where you want to add a path.
-connectionName	Type the unique name of the iSCSI connection where you want to add a path.
-descr	Type the iSCSI path description.
-addr	Type the IP address of the remote system iSCSI destination. NOTE: Do not specify an iSCSI portal address which only redirects the connection to another address. Unity does not support iSCSI redirection.
-port	The default TCP port is 3260. If the port number is different from the default, type the TCP port of the remote system iSCSI destination.
-if	Specify a comma-separated list of iSCSI interfaces on the local source system. NOTE: You can find existing iSCSI interfaces information by using the <code>/net/if show</code> command. If a system has two SPs, make sure that you specify iSCSI network interfaces for both SPs.
-async	Run the operation in asynchronous mode.

Example

The following command creates an iSCSI path for the "iscsi_conn_1" iSCSI connection.

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /remote/iscsi/connection/path create -
connection iscsi_conn_1 -addr 10.0.0.4 -if if_1,if_2
```

Storage system address: 10.0.0.1

Storage system port: 443

HTTPS connection

Operation completed successfully.

View iSCSI connection path settings

View details for existing iSCSI connection paths.

Format

```
/remote/iscsi/connection/path [{-connection <value> | -connectionName <value>}] show
```

Object qualifiers

Qualifier	Description
-connection	Type the ID of the iSCSI connection.
-connectionName	Type the unique name of the iSCSI connection.

Example

This example shows all iSCSI connection paths.

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /remote/iscsi/connection/path -connection
iscsi_conn_1 show -detail
```

Storage system address: 10.0.0.1

Storage system port: 443

HTTPS connection

1: Index = 1

iscsi connection = iscsi_conn_1

iscsi connection name = MyConn

iscsi path description = SP 2 node 1

Remote iSCSI address = 10.0.0.4

Remote iSCSI port = 3260

Local iSCSI interfaces = IF_1,IF_2

2: Index = 2

iscsi connection = iscsi_conn_1

iscsi connection name = MyConn

iscsi path description = SP 1 node 2

Remote iSCSI address = 10.0.0.6

Remote iSCSI port = 3260

Local iSCSI interfaces = IF_1,IF_2

Delete an iSCSI connection path

Deletes an existing iSCSI connection path.

NOTE: When you delete an iSCSI connection, any iSCSI connection paths associated with that iSCSI connection are also deleted. You do not need to manually delete the paths.

Format

```
/remote/iscsi/connection/path {-connection <value> | -connectionName <value>} -index <value> delete [-async]
```

Object qualifiers

Qualifier	Description
-connection	Type the ID of the iSCSI connection that has the path you want to delete.
-connectionName	Type the unique name of the iSCSI connection that has the path you want to delete.
-index	Type the number of the iSCSI path that you want to delete from the iSCSI connection.

Action qualifier

Qualifier	Description
-async	Run the operation in asynchronous mode.

Example

The following command deletes the "1" path from the "iscsi_conn_1" iSCSI connection.

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /remote/iscsi/connection/path -connection iscsi_conn_1 -index 1 delete
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

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.

The following table lists the attributes for remote storage systems:

Table 74. Remote system attributes

Attribute	Description
ID	ID of the remote system.
Model	Model number of the remote system.
Serial number	Serial number of the remote system.
Address	Network name or management IP address of the remote system.
Alternate management address	An alternative management IP address of the remote system.

Table 74. Remote system attributes (continued)

Attribute	Description
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"> • <code>OK (5)</code> —Resource is operating normally. • <code>Degraded/Warning (10)</code> —Working, but one or more of the following may have occurred: <ul style="list-style-type: none"> ◦ One or more of its storage pools are degraded. ◦ Its replication session is degraded. ◦ Its replication session has faulted. ◦ It has almost reached full capacity. Increase the primary storage size, or create additional resources to store your data, to avoid data loss. • <code>Minor failure (15)</code> —One or both of the following may have occurred: <ul style="list-style-type: none"> ◦ One or more of its storage pools have failed. ◦ The associated iSCSI node has failed. • <code>Major (20)</code> —One or both of the following may have occurred: <ul style="list-style-type: none"> ◦ Resource is unavailable. ◦ One or more of the associated storage pools have failed. • <code>Critical failure (25)</code> —One or more of the following may have occurred: <ul style="list-style-type: none"> ◦ One or more of its storage pools are unavailable. ◦ Resource is unavailable. ◦ Resource has reached full capacity. Increase the primary storage size, or create additional resources to store your data, to avoid data loss. • <code>Non-recoverable error (30)</code> —One or both of the following may have occurred: <ul style="list-style-type: none"> ◦ Resource is unavailable. ◦ One or more of the associated storage pools are unavailable.
Health details	Additional health information.
Source user name	For storage systems that are the source in a replication session, the username that is used to access the system.
Source user password	For storage systems that are the source in a replication session, the user password that is used to access the system.
Local interfaces	The list of local interface identifiers used to create the interconnection between the two systems.
Remote interfaces	The list of remote interface identifiers used to create the interconnection between two systems.
Destination user name	For storage systems that are the destination in a replication session, the username that is used to access the system.
Destination user password	For storage systems that are the destination in a replication session, the user password that is used to access the system.
Connection type	<p>The type of connection with the remote system. Valid values are:</p> <ul style="list-style-type: none"> • <code>sync</code> • <code>async</code> • <code>both</code>
Synchronous FC ports	<p>The fibre channel ports enabled for synchronous replication.</p> <p> NOTE: For a local system (RS_0), this field will appear empty only when there are no FC ports. For remote systems, this will be empty when the connection type is asynchronous.</p>

Create remote system configurations

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

NOTE: For a source VNX system with two control stations, the home directory of the sysadmin user, which is used in configuring the import connection, must exist on the primary control station of the VNX.

Format

```
/remote/sys create -addr <value> [-type VNX] -srcUsername <value> {-srcPassword <value> | -srcPasswordSecure} -dstUsername <value> {-dstPassword <value> | -dstPasswordSecure} [-connectionType {sync | async | both}]
```

Action qualifiers

Qualifier	Description
-addr	Specify the network name or IP address of the remote system.
-type	Specify the remote system type. Valid values are: <ul style="list-style-type: none">VNX
-srcUsername	For systems that are the source in a replication, type the username that is used to access the system.
-srcPassword	For systems that are the source in a replication, type the user password that is used to access the system.
-srcPasswordSecure	Specify the password in secure mode. Once you run the command with this qualifier, you will be asked to type the password separately.
-dstUsername	For systems that are the destination in a replication session or VNX in an import session, specify the username that is used to access the system.
-dstPassword	For systems that are the destination in a replication session or VNX in an import session, specify the user password that is used to access the system.
-dstPasswordSecure	Specify the password in secure mode. Once you run the command with this qualifier, you will be asked to type the password separately.
-connectionType	Specify this qualifier to indicate the type of replication connection. Valid values are async, sync, or both.

Example

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

- Network address is 10.64.75.10.
- Includes access credentials for when the system is the source or destination.

The configure remote system receives the ID RS_65536:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /remote/sys create -addr 10.64.75.10 -type VNX -dstUsername admin1 -dstPassword Password789!
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection
```

```
ID = RS_65536
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
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

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 21 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 -detail
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

1:      ID                      = RS_1
      Address                  = 10.2.3.1
      Alternate Management Address =
      Model                   = Unity 300
      Serial number           = FCNC987654321
      Connection type         = async
      Local interfaces        = N/A
      Remote interfaces       = N/A
      Operational status      = OK (0x2)
      Health state            = OK (5)
      Health details          = "Communication with the replication host is
```

```
established. No action is required."
Synchronous FC ports          = spb_fc4, spa_fc4
```

Change settings for remote storage systems

Changes the configuration settings for a remote system.

NOTE: If a replication connection already exists and you plan to add a different mode of file replication, do not attempt to create a new connection. Change the existing replication connection mode to Both. Also, ensure that you have the appropriate interface types configured to support both asynchronous replication (eth2, eth3) and synchronous replication (sync replication mgmt port).

Format

```
/remote/sys -id <value> set [ -addr <value> ] [ -dstUsername <value> { -dstPassword <value>
| -dstPasswordSecure } ] [ -connectionType {sync | async | both}]
```

Object qualifier

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

Action qualifiers

Qualifier	Description
-addr	Type the network name or management IP address of the remote system.
-dstUsername	Type the username that is used to access the remote system.
-dstPassword	Type the user password that is used to access the remote system.
-dstPasswordSecure	Specify the password in secure mode - the user will be prompted to input the password.
-connectionType	Specify this qualifier to indicate the type of replication connection. Valid values are async, sync, or both.

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 -addr
"10.64.74.2" -dstUsername Local/joe -dstPassword Password456!
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

ID = RS_1

Operation completed successfully.
```

Delete remote system configurations

Deletes the configuration for a remote system.

NOTE: 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
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection
Operation completed successfully.
```

Cabinet level unplanned failover of replication sessions

Execute a failover of all NAS server synchronous replication sessions from the remote system to the local system (unplanned failover). Replication sessions of file systems created on the affected NAS servers will also fail over automatically.

Format

```
/remote/sys -id <value> failover [-force]
```

Object qualifiers

Qualifier	Description
-id	Type the ID of the remote system from which to failover its NAS server synchronous replication sessions.

Action qualifiers

Qualifier	Description
-force	Specifies whether to skip checking the network connection to the remote system. Required when the network connection is healthy. No values are allowed.

Example

The following command executes a cabinet level unplanned failover replication operation issued for a Unity system:

```
uemcli /remote/sys -id RS_1 failover
```

```
Storage system address: 10.0.0.1
Storage system port: 443
```


HTTPS connection

ID = RS_1
Operation completed successfully.

NOTE: After an unplanned failover, the NAS servers and file systems on the original source system must be updated to reflect the new status. If there is a large number of NAS servers and file systems, this change may take several minutes to complete. During this period, resume and failback operations of the synchronous replication sessions will not work. It is recommended to wait for all of the updates to complete before running a resume or failback operation. There is no impact to data access while this update is occurring.

Manage VMware vCenter

Manage VMware vCenter servers.

The following table lists the attributes for VMware vCenter.

Table 75. VMware vCenter attributes

Attribute	Description
ID	ID of the VMware virtual center
Address	Domain name or IP address of VMware vCenter.
User name	Name of the administrator account on the VMware vCenter.
Password	Password of the administrator account on the VMware vCenter.
Description	Description of the VMware vCenter.
VASA provider state	Indicates whether the system is registered as a VASA provider in vCenter. Values are: <ul style="list-style-type: none">RegisteredNot registeredNot supported <p>NOTE: Automatic VASA registration is not supported on vSphere versions earlier than 6.0. The storage system can be registered as a VASA provider with only one vCenter at a time.</p>
Local username	The username of the local account that vSphere will use to register the system as a VASA provider. <p>NOTE: It is recommended that you create a new user with the <code>/user/account</code> command and set the role to <code>vmadmin</code>.</p>
Local password	The password of the local account that vSphere will use to register the system as a VASA provider.


Create VMware vCenter

Adds the vCenter credentials and discovers any ESXi host managed by that vCenter. The vCenter credentials are stored in the storage system. In order to execute this command, the user must have account on the storage system.

Format

```
/virt/vmw/vc create -addr <value> -username <value> {-passwd <value> | -passwdSecure} [-  
descr <value>] [-registerVasaProvider {yes -localUsername <value> {-localPasswd <value> |  
-localPasswdSecure} | no}]
```

Action qualifier

Qualifier	Description
-addr	Domain name or IP address or domain name of the VMware vCenter.
-username	Specify the VMware administrator username used to access the VMware vCenter.
-passwd	Specify the VMware administrator password used to access the VMware vCenter.
-passwdSecure	Specify the password in secure mode. The user will be prompted to input the password.
-descr	Specify the description of the VMware vCenter server.
-registerVasaProvider	Specify to register the system as a VASA provider with this vCenter server. Valid values are: <ul style="list-style-type: none">• yes• no
-localUsername	Specify the username of the system account that will be used by vCenter to register the system as a VASA provider.  NOTE: It is recommended that you create a new user with the <code>/user/account</code> command and set the role to <code>vmadmin</code> . The storage system can be registered as a VASA provider with only one vCenter at a time.
-localPasswd	Specify the password of the system account that will be used by vCenter to register the system as a VASA provider.
-localPasswdSecure	Specify the VASA password in secure mode, which requires the user to input the password when prompted.

Example 1

The following command adds virtual center credentials:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /virt/vmw/vc create -addr 10.11.11.111 -username administrator@vsphere.local -passwd xxx -descr "Add vCenter"
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection
```

```
ID = VC_1
Operation completed successfully
```

Example 2

The following command adds a vCenter and registers the storage system as a VASA provider.

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /virt/vmw/vc create -address 10.11.11.111 -username root -passwd xxx -descr "Add virtual center" -registerVasaProvider yes -localUsername admin -localPasswd Password321
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection
```

```
ID = VC_1
Operation completed successfully
```

Set the credentials or description of an existing vCenter server

Modifies the credentials or description of the existing vCenter server. In order to execute this command the user must have an account on the storage system.

Format

```
/virt/vmw/vc -id <value> set [-addr <value>] [-username <value> {-passwd <value> | -passwdSecure} ] [-descr <value>]
```

Object qualifier

Qualifier	Description
-id	Identifies the VMware vCenter server.

Action qualifier

Qualifier	Description
-addr	Specifies the new IP address or domain name of the VMware vCenter server.
-username	Specifies the VMware administrator username.
-passwd	Specifies the VMware administrator password.
-passwdSecure	Specifies the password in secure mode - the user will be prompted to input the password.
-descr	Specifies the new description of the VMware vCenter server.

Example

The following command specifies the new description of the VMware vCenter server:


```
uemcli /virt/vmw/vc -id VC_1 set -descr "This vCenter manages 2 ESXi hosts"
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection
```

```
ID = VC_1
Operation completed successfully.
```

Delete an existing vCenter server

Removes an existing VMware vCenter server and its associated ESXi hosts.

 **NOTE:** If the Unity system is registered as a VASA provider in vCenter and you delete the vCenter from Unity, the Unity system will be unregistered as a VASA provider from vCenter.

Format

```
/virt/vmw/vc -id <value> delete
```

Object qualifier

Qualifier	Description
-id	Identifies the VMware vCenter server.

Example

The following example deletes an existing vCenter server and any of its associated ESXi hosts.

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /virt/vmw/vc -id VC_1 delete
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

Operation completed successfully
```

View all vCenter servers

Displays a list of configured VMware vCenter servers.

Format

```
/virt/vmw/vc [-id <value>] show
```

Object qualifier

Qualifier	Description
-id	Identifies the VMware vCenter server.

Example

The following example shows a list of all vCenter servers.

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /virt/vmw/vc show
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

1:      ID              = VC_1
      Address          = 10.1.1.1
      Description       = This vCenter manages 2 ESXi hosts
      VASA provider state = yes
```

Refresh all vCenter servers

Rescan details of all configured VMware vCenter servers.

Format

```
/virt/vmw/vc refresh [-scanHardware]
```

Object qualifier

Qualifier	Description
-id	Specify the ID of the vCenter. If not specified, all attached vCenters are refreshed.
-scanHardware	Specify to rescan hardware changes (this takes additional time).

Example

The following example rescans all vCenters.

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /virt/vmw/vc refresh -scanHardware
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

Operation completed successfully.
```

Manage ESXi hosts

Manage VMware ESXi hosts.

The following table lists the attributes for ESXi hosts.

Table 76. ESXi host attributes

Attribute	Description
ID	ID of the ESXi host.
Name	Name of the ESXi host.
Address	Domain name or IP address of ESXi host.
Virtual center	Identifier of the VMware VCenter server managing the ESXi host.
Username	Name of the user account on the ESXi host.
Password	Password of the user account on the ESXi host.
Description	Description of the ESXi host.
NFSv4 supported	Indicates if the NFSv4 protocol is supported for the host. Valid values are: <ul style="list-style-type: none">• yes• no
NFS username	Displays the NFS user authentication information configured for the ESXi host. The same username should be configured on the VMware NFS datastore in order to enable secure NFS access with Kerberos for that datastore.

Create an ESXi host

Adds a VMware ESXi host.

Format

```
/virt/vmw/esx create -addr <value> { -vc <value> | -username <value> {-passwd <value> | -passwdSecure} } [ -descr <value> ] [ -resolveConflicts { yes | no } ]
```

Action qualifier

Qualifier	Description
-addr	Domain name or IP address of the ESXi host.

Qualifier	Description
-vc	Identifies the VMware vCenter server.
-username	Specifies the username used to access the VMware ESXi host.
-passwd	Specifies the password used to access the VMware ESXi host.
-passwdSecure	Specifies the password in secure mode - the user will be prompted to input the password.
-descr	Specifies the description of the VMware ESXi host.
-resolveConflicts	Specifies the option to resolve IP address or initiator conflicts interactively. Valid values are yes or no (default).

Example 1

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /virt/vmw/esx create -addr 10.1.1.1 -username root -passwd xxx -descr "My ESXi host"
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection
```

```
ID = ESX_1
Operation completed successfully
```

Example 2

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /virt/vmw/esx create -addr 10.1.1.1 -vc VMwareVC_12 -resolveConflicts yes
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection
```

The ESX host to be created has IP addresses and/or Initiators already present in an existing host.

The ID of the existing host is: Host_12

The IP addresses in conflict are: 10.14.12.219, 10.14.12.220

The Initiators in conflicts are: iqn.1998-01.com.vmware:test1-1, iqn.1998-01.com.vmware:test1-2

WARNING, the existing host has IP addresses and/or Initiators not found in the ESX host to be created. If you continue with the ESX host creation, those IP addresses and/or Initiators will be removed and can no longer be used for storage access.

The IP address not in the ESX host are: 10.14.12.217, 10.14.12.218

The Initiators not in the ESX host are: iqn.1998-01.com.vmware:test1-3

Do you want to convert the existing host to the ESX host?

Yes / no:yes

```
ID = ESX_1
Operation completed successfully
```

Change ESXi host credentials

Changes ESXi host credentials and/or description. In order to execute this command the user must have account on the storage system.


Format

```
/virt/vmw/esx -id <value> set [ -descr <value> ] [ -username <value> { -passwd <value> |  
-passwdSecure } ] [ -addr <value> ]
```

Object qualifier

Qualifier	Description
-id	Identifies the VMware ESXi host.

Action qualifier

Qualifier	Description
-descr	Specifies the comment or description.
-username	Specifies the username used to access the VMware ESXi host.
-passwd	Specifies the password used to access the VMware ESXi host.
-passwdSecure	Specifies the new password in secure mode - the user will be prompted to input the password.
-addr	Specifies the domain name or IP address of the ESXi host in order for Unisphere to contact the ESXi host directly.  NOTE: This is only applicable for standalone ESXi hosts.

Example

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /virt/vmw/esx -id ESX_1 set -descr  
"Changing ESXi host description"
```

```
Storage system address: 10.0.0.1  
Storage system port: 443  
HTTPS connection
```

```
ID = ESX_1  
Operation completed successfully.
```

Delete ESXi host credentials

Deletes ESXi host credentials. This will also remove access from the specified host to any VMware datastores or protocol endpoints that are associated with it.

Format

```
/virt/vmw/esx -id <value> delete
```

Object qualifier

Qualifier	Description
-id	Identifies the ESXi host.

Example

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /virt/vmw/esx -id ESX_1 delete
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

Operation completed successfully.
```

View all existing ESXi hosts

Displays a list of all configured VMware ESXi hosts.

Format

```
/virt/vmw/esx [{-id <value> | -vc <value>}] show
```

Object qualifier

Qualifier	Description
-id	Identifies the VMware ESXi host.
-vc	Identifies the VMware vCenter server.

Example

The following example shows how to display all of the ESXi hosts on the vCenter connected to the system.

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /virt/vmw/esx -vc VC_1 show
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

1:      ID          = ESX_1
      Name          = nlpcl2240.aa.bb.com
      vCenter       = VC_1
      Address       = 10.10.10.100
      Description   =
      NFSv4 supported = yes
      NFS username  = root

2:      ID          = ESX_2
      Name          = nlpcl2241.xx.yy.com
      vCenter       = VC_1
      Address       = 10.10.10.101
      NFSv4 supported = no
      NFS username  =
```

Discover all ESXi hosts

Lists all VMware ESXi hosts on the specified VMware vCenter server.

Format

```
/virt/vmw/esx discover { -vc <value> | -vcAddr <value> -username <value> {-passwd <value> |  
-passwdSecure} } [ -createAll ]
```

Action qualifier

Qualifier	Description
-vc	Identifies the existing VMware vCenter.
-vcAddr	IP address or domain name of the VMware vCenter.
-username	Specifies the name of the VMware vCenter.
-passwd	Specifies the password of the VMware vCenter
-passwdSecure	Specifies the password in secure mode - the user will be prompted to input the password.
-createAll	Adds all discovered ESXi hosts automatically.

Example

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /virt/vmw/esx discover -vc VC_1
```

```
Storage system address: 10.0.0.1  
Storage system port: 443  
HTTPS connection  
  
1:      Name      = nlpc12240.us.dg.com  
2:      Name      = nlpc12241.us.dg.com  
  
Operation completed successfully
```

Refresh an ESXi host

Rescans details of a VMware ESXi host.

Format

```
/virt/vmw/esx [-id <value>] refresh [-scanHardware]
```

Object qualifier

Qualifier	Description
-id	Identifies the ESXi host. If an ID is not specified, all virtualization objects are rescanned.

Action qualifier

Qualifier	Description
-scanHardware	Specify to rescan hardware changes also (takes additional time).

Example

The following command rescans the hardware to discover additional ESXi hosts.

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /virt/vmw/esx refresh -scanHardware
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection
```

```
Operation completed successfully.
```

Virtual machine

Manage VMware virtual machines.

The following table lists the attributes for Virtual machine.

Table 77. Virtual machine attributes

Attribute	Description
ID	ID of the virtual machine.
Name	Name of the virtual machine
Description	Description of the virtual machine.
ESX server	ESXi hosts containing the virtual machine.
OS	Guest operating system.
State	Virtual machine power state. Valid values are: <ul style="list-style-type: none">• Powered on• Powered off• Suspended

View all existing virtual machines

Displays a list of all existing virtual machines on existing ESXi hosts on the Unity system.

Format

```
/virt/vmw/vm [{-id <value> | -esx <value>}] show
```

Object qualifier

Qualifier	Description
-id	Identifies the virtual machine.
-esx	Identifies the ESXi host.

Example

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /virt/vmw/vm -esx ESX_1 show
```

```
Storage system address: 10.0.0.1
Storage system port: 443
```

HTTPS connection

```
1:      ID      = VM_1
      Name      = WinVM1
      vCenter   = VC_1
      ESX_server = ESX_1
      State     = Powered On

2:      ID      = VM_2
      Name      = LinVM3
      vCenter   = VC_1
      ESX_server = ESX_1
      State     = Suspended
```

VM hard disk

Manage hard disk properties for VMware virtual machines stored on the Unity system.

The following table lists the attributes for VM hard disks.

Table 78. VM hard disk attributes

Attribute	Description
Name	Name of the hard disk.
Type	Type of the VM hard disk.
Capacity	VM hard disk capacity.
Datastore	Associated datastore.

View all hard disks

Displays hard disk properties for a specified virtual machine stored on the Unity system.

Format

```
/virt/vmw/vmdevice -vm <value> show
```

Object qualifier

Qualifier	Description
-vmId	Identifies the virtual machine.

Example

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /virt/vmw/vmdevice -vm VM_1 show
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

1:      Name      = Hard disk 1
      Type      = VM Hard Disk
      Capacity   = 107374182400 (100GB)
      Datastore  = Storage1

2:      Name      = Hard disk 2
      Type      = VM Hard Disk
```

```
Capacity = 107374182400 (100GB)  
Datastore = Storage1
```

Manage Hardware Components

This chapter contains the following topics:

Topics:

- [Manage Storage Processor \(SP\)](#)
- [Manage disk](#)
- [Manage battery \(physical deployments only\)](#)
- [Manage power supply \(physical deployments only\)](#)
- [Manage link control card \(LCC\) \(physical deployments only\)](#)
- [Manage SSD \(physical deployments only\)](#)
- [Manage disk array enclosure \(DAE\)](#)
- [Manage disk processor enclosure \(DPE\)](#)
- [Manage memory module \(physical deployments only\)](#)
- [Manage System Status Card \(physical deployments only\)](#)
- [Manage fan modules \(physical deployments only\)](#)
- [Manage I/O modules, embedded modules, and 4-port cards \(physical deployments only\)](#)

Manage Storage Processor (SP)

The following table lists the health state values for the storage processor (SP) in Normal mode.

Table 79. Storage processor health state values (Normal mode)

Code	Health state	Reason(s)
0	Unknown	<ul style="list-style-type: none"> • The health of the component cannot be determined.
5	OK	<ul style="list-style-type: none"> • The SP is operating normally.
10	Degraded/Warning	<ul style="list-style-type: none"> • The write cache is disabled on the SP. • The SP is starting.
20	Major failure	<ul style="list-style-type: none"> • The SP has faulted. • The SP is missing. • The SP is not responding.

The following table lists the health state values for the storage processor in Service/Rescue mode.

Table 80. Storage processor health state values (Service/Rescue mode)

Code	Health state	Reason(s)
0	Unknown	<ul style="list-style-type: none"> • The health of the component cannot be determined.
10	Degraded/Warning	<ul style="list-style-type: none"> • A user has placed the SP into the Service mode.
20	Major failure	<ul style="list-style-type: none"> • The system software on this SP has encountered a problem. • The CPU in the SP has faulted. • IO module 0 in the SP has faulted. • IO module 1 in the SP has faulted. • The CPU and IO module 0 in the SP have faulted. • The CPU and IO module 1 in the SP have faulted. • Memory DIMM 0 in the SP has faulted. • Memory DIMM 0 and 1 in the SP have faulted.

Table 80. Storage processor health state values (Service/Rescue mode) (continued)

Code	Health state	Reason(s)
		<ul style="list-style-type: none"> • Memory DIMM 1 in the SP has faulted. • Memory DIMM 2 in the SP has faulted. • Memory DIMMs in the SP have faulted. • The SP has faulted. • The SSD in the SP has faulted. • The entire blade in the SP has faulted. • The fibre cable connection in the SP has faulted. • The enclosure in the SP has faulted. • An I/O module in the SP is configured incorrectly. • An unexpected error has occurred in the SP. • A cable is in the wrong SAS port on the SP. • No SAS port was found on the SP. • There is an invalid disk configuration on the SP • There is no I/O between an I/O module in the SP and a link control card on a disk array enclosure. • A FLARE DB drive in the storage processor has faulted. • One of the first four drives have mismatched types. • One of the first four drives has an invalid block size. • One of the first four drives has a mismatched size. • DPE resume is missing an EMC serial number.

View Storage Processor

View existing Storage Processors (SPs).

Format

```
/env/sp [-id <value>] show
```

Object qualifier

Qualifier	Description
-id	Identifies the Storage Processor.

Example 1 (physical deployments only)

The following command displays the existing SPs:

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

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

1: ID           = spa
   DPE          = DPE_1
   Slot         = 1
   Mode         = Normal
   Health state = OK (5)
   Memory size  = 34359738368 (32G)

2: ID           = spb
   DPE          = DPE_1
   Slot         = 2
```

```
Mode           = Normal
Health state   = OK (5)
Memory size    = 34359738368 (32G)
```

Example 2 (virtual deployments only)

The following command displays existing SP for a virtual system.

```
uemcli -d 10.0.0.2 -u Local/joe -p MyPassword456! /env/sp show -detail
```

```
Storage system address: 10.0.0.2
Storage system port: 443
HTTPS connection

1:   ID           = spa
     UUID        = 421DB2B2-6AAC-BB48-73DE-513390292444
     DPE         = dpe
     Slot        = 0
     Name        = SP A
     Mode        = Normal
     Health state = OK (5)
     Health details = "The component is operating normally. No action is required."
     Model       = VIRT SP 12GB
     Memory size  = 12884901888 (12.0G)
```

Manage disk

The following table lists the health state values for the drive.

Table 81. Physical drive health state values

Code	Health state	Reason(s)
0	Unknown	<ul style="list-style-type: none">The health of the component cannot be determined.
5	OK	<ul style="list-style-type: none">The drive is operating normally.The drive slot is empty.
10	Degraded/Warning	<ul style="list-style-type: none">The drive is resynchronizing with the system.The drive cannot be used because the system has exceeded the maximum number of allowable drives.
15	Minor failure	<ul style="list-style-type: none">The drive is inserted in the wrong slot.The drive is removed.The drive is offline.
20	Major failure	<ul style="list-style-type: none">The drive has faulted.The drive is unsupported.

Table 82. Virtual disk health state values

Code	Health state	Reason(s)
0	Unknown	<ul style="list-style-type: none">The health of the component cannot be determined.
5	OK	<ul style="list-style-type: none">The virtual disk is operating normally.
7	OK_BUT	<ul style="list-style-type: none">The virtual disk was originally configured for a different storage system.The virtual disk was originally configured for a different storage pool.
20	Major failure	<ul style="list-style-type: none">The virtual disk is not accessible.The virtual disk is too small.The virtual disk is too large.

Table 82. Virtual disk health state values (continued)

Code	Health state	Reason(s)
		<ul style="list-style-type: none">The virtual disk failed due to system or I/O error.

View disk

View existing drives.

Format

```
/env/disk [{-id <value> | -pool <value> | -fastcache | -unused}] show
```

Object qualifier

Qualifier	Description
-id	ID of the drive.
-pool	Shows the drive that belong to the specified pool.
-fastcache	Shows the drives used in FAST Cache.
-unused	Shows unused drives.

Example 1

The following command displays the basic attributes of all drives on a physical deployment.

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

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

1:      ID              = DISK_0
      Enclosure         = DAE_1
      Slot              = 0
      Health state      = OK (5)
      User capacity     = 2199023255552 (2T)
      Used by FAST Cache = no
      Pool ID           = pool_1

2:      ID              = DISK_1
      Enclosure         = DAE_1
      Slot              = 1
      Health state      = OK (5)
      User capacity     = 2199023255552 (2T)
      Used by FAST Cache = no
      Pool ID           = pool_1
```

Example 2

The following command displays the details of all drives on a physical deployment.

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /env/disk show -detail
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

1:      ID              = dae_1_2_disk_59
```



```

Enclosure          = dae_1_2
Slot               = 59
Bank slot          = C19
Name               = Disk 59
Health state       = OK (5)
Health details     = "The component is operating normally. No action is
required."
Type               = SAS
Tier               = performance
Capacity           = 881132310528 (820.6G)
Rotational speed   = 10000 rpm
User capacity      = 797989670912 (743.1G)
Used by FAST Cache = no
Pool ID            = Unconfigured
Pool               = Unconfigured
Current speed      = 6 Gbps
Maximum speed      = 6 Gbps
Manufacturer       = SEAGATE
Model              = ST990080 CLAR900
Vendor capacity    = 966367641600 (900.0G)
Part number        = 005049206PWR
Serial number      = 6XS3A9CG
Firmware revision  = CS19
WWN                = 06:00:00:00:05:00:00:00:01:00:00:00:00:00:00:03
Days remaining to EOL = 1497

```

Example 3

The following command displays the details of all drives on a single-SP virtual deployment.

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /env/disk show -detail
```

```

Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

1:      ID          = vdisk_1
        SCSI ID     = 0:3
        Name        = Virtual Disk 1
        Health state = OK (5)
        Health details = "The component is operating normally. No action is required."
        Type        = virtual
        Tier        = capacity
        Capacity     = 268435456000 (250.0G)
        Rotational speed =
        User capacity = 268435435520 (249.9G)
        Pool ID      = pool_1
        Pool         = StoragePool100
        Current speed =
        Maximum speed =
        Manufacturer = VMware
        Model        = Virtual disk
        Vendor capacity = 268435456000 (250.0G)
        WWN          = 06:00:00:00:05:00:00:00:04:00:00:00:00:00:00:03

```

Example 4

The following command displays the details of all drives on a dual-SP virtual deployment.

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /env/disk show -detail
```

```

Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

1:      ID          = vdisk_1
        SCSI ID SPA  = 0:3
        SCSI ID SPB   = 0:4

```

```
Name                = Virtual Disk 1
Health state        = OK (5)
Health details      = "The component is operating normally. No action is required."
Type                = virtual
Tier                = capacity
Capacity            = 268435456000 (250.0G)
Rotational speed    =
User capacity       = 268435435520 (249.9G)
Pool ID             = pool_1
Pool                = StoragePool00
Current speed       =
Maximum speed       =
Manufacturer        = VMware
Model               = Virtual disk
Vendor capacity     = 268435456000 (250.0G)
WWN                 = 06:00:00:00:05:00:00:00:04:00:00:00:00:00:00:03
```

Rescan disk (virtual deployments only)

Rescan the system for available virtual disks.

Format

```
/env/disk rescan [-async]
```

Action qualifier

Qualifier	Description
-async	Run the operation in asynchronous mode.

Example

The following command rescans the system for hot-plugged virtual disks.

```
uemcli -d 10.0.0.2 -u Local/joe -p MyPassword456! /env/disk rescan
```

```
Storage system address: 10.0.0.2
Storage system port: 443
HTTPS connection

Operation completed successfully.
```

Change disk settings (virtual deployments only)

Change settings of an existing disk.


Format

```
/env/disk -id <value> set [-async] [-name <value>] [-tier <value>]
```

Object qualifier

Qualifier	Description
-id	Disk identifier.

Action qualifier

Qualifier	Description
-async	Run the operation in asynchronous mode.
-name	Specify the new name for the disk.
-tier	Specify the new tier. Valid values are: <ul style="list-style-type: none">• capacity• performance• extreme  NOTE: Disks without a tier cannot be used for pool provisioning.

Example

The following command changes the name of the virtual disk with the ID "vdisk_1".

```
uemcli -d 10.0.0.2 -u Local/joe -p MyPassword456! /env/disk -id vdisk_1 set -name "High-performance storage"
```

```
Storage system address: 10.0.0.2
Storage system port: 443
HTTPS connection

Operation completed successfully.
```

Manage battery (physical deployments only)

The following table lists the health state values for the system batteries.

Table 83. Battery health state values

Code	Health state	Reason(s)
0	Unknown	<ul style="list-style-type: none">• The health of the component cannot be determined.
5	OK	<ul style="list-style-type: none">• The battery is operating normally.
10	Degraded/Warning	<ul style="list-style-type: none">• The battery is charging.
20	Major failure	<ul style="list-style-type: none">• The battery has faulted.• The battery is missing.

View battery

View a list of system batteries.

Format

```
/env/bat [-id <value>] show
```

Object qualifier

Qualifier	Description
-id	ID of the battery.

Example

The following command displays a list of system batteries:

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

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

1:      ID      = Bat_0
      SP      = SPA
      Slot    = 0
      Health state = OK (5)

2:      ID      = Bat_0
      SP      = SPA
      Slot    = 1
      Health state = Degraded/Warning (10)
```

Manage power supply (physical deployments only)

The following table lists the health state values for system power supplies.

Table 84. Power supply health state values

Code	Health state	Reason(s)
0	Unknown	<ul style="list-style-type: none">The health of the component cannot be determined.
5	OK	<ul style="list-style-type: none">The power supply is operating normally.
20	Major failure	<ul style="list-style-type: none">The power supply has faulted.The power supply is not receiving power.The power supply has been removed.

View power supply

View a list of system power supplies.

Format

```
/env/ps [-id <value>] show
```

Object qualifier

Qualifier	Description
-id	ID of the power supply.

Example

The following command displays a list of system power supplies:

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

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

1:      ID          = Pow_0
      Enclosure    = DPE_
      SP           = SPA
      Slot         = 0
      Health state = OK (5)

2:      ID          = Pow_1
      Enclosure    = DPE_
      SP           = SPA
      Slot         = 1
      Health state = OK(5)
```

Manage link control card (LCC) (physical deployments only)

The following table lists the health state values for system link control cards (LCCs).

Table 85. Link control card health state values

Code	Health state	Reason(s)
0	Unknown	<ul style="list-style-type: none">The health of the component cannot be determined.
5	OK	<ul style="list-style-type: none">The LCC is operating normally.
20	Major failure	<ul style="list-style-type: none">The LCC has faulted.The LCC has been removed.

View link control card

View a list of LCCs.

Format

```
/env/lcc [-id <value>] show
```

Object qualifier

Qualifier	Description
-id	ID of the LCC.

Example

The following command displays a list of system LCCs:

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

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

1: ID          = LCC_0
```

```
DAE          = DAE_0
Slot         = 0
Health state = OK (5)

2: ID        = LCC_1
DAE          = DAE_0
Slot         = 1
Health state = OK(5)
```

Manage SSD (physical deployments only)

The following table lists the health state values for system SSDs.

Table 86. SSD health state values

Code	Health state	Reason(s)
0	Unknown	<ul style="list-style-type: none">The health of the component cannot be determined.
5	OK	<ul style="list-style-type: none">The SSD is operating normally.
10	Degraded/Warning	<ul style="list-style-type: none">The SSD is failing.
20	Major failure	<ul style="list-style-type: none">The SSD has failed.The SSD has been removed.

View SSD

View a list of system SSDs.

Format

```
/env/ssd [-id <value>] show
```

Object qualifier

Qualifier	Description
-id	ID of the SSD.

Example

The following command displays a list of system SSDs:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /env/ssd show -detail
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

1:  ID          = spa_ssd_0
    SP          = spa
    Slot        = 0
    Name        = SP A Internal Disk 0
    Type        = SATA
    Health state = OK (5)
    Health details = "The component is operating normally. No action is required."
    Manufacturer =
    Model       = Intel DC 3500 Series SSDs M.2
```

Part number = INTEL SSDCKHB080G4M 118000039
Serial number = BTWM535008WA

Manage disk array enclosure (DAE)

The following table lists the health state values for system disk array enclosures (DAEs).

Table 87. Disk array enclosure health state values

Code	Health state	Reason(s)
0	Unknown	<ul style="list-style-type: none">The health of the component cannot be determined.
5	OK	<ul style="list-style-type: none">The DAE is operating normally.
7	OK_BUT	<ul style="list-style-type: none">The DAE is adjusting the communication speed.
10	Degraded/Warning	<ul style="list-style-type: none">The DAE performance is degraded.
20	Major failure	<ul style="list-style-type: none">The DAE has a disk drive- type mismatch.The DAE has taken a communication fault.The DAE has faulted.The DAE has a faulted LCC.The DAE has been misconfigured.The DAE has been miscabled.The DAE has been removed.The DAE had taken a power fault.The DAE is connected to a faulted I/O module.

View disk array enclosure

View a list of system DAEs.

Format

```
/env/dae [-id <value>] show
```

Object qualifier

Qualifier	Description
-id	ID of the DAE.

Example

The following command displays a list of system DAEs:

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

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection
```

```
1:      ID                      = dae_0_1
```

```

Slot                = 0
Name                = DAE 0 1
Health state        = OK (5)
Health details      = "The component is operating normally. No action is
required."
Manufacturer        = USI
Model               = 25 DRIVE 6G SAS DERRINGER DAE
Part number         = 100-562-712
Serial number       = US1D1102500097
Power (Present)     = 232 watts
Power (Rolling Average) = 231 watts
Temperature (Present) = 84° F (29° C)
Temperature (Rolling Average) = 84° F (29° C)
Bus                 = 0
Enclosure number    = 1

```

Manage disk processor enclosure (DPE)

The following table lists the health state values for system disk processor enclosures (DPEs).

Table 88. Disk processor enclosure health state values

Code	Health state	Reason(s)
0	Unknown	<ul style="list-style-type: none"> The health of the component cannot be determined.
5	OK	<ul style="list-style-type: none"> The DPE is operating normally.
7	OK_BUT	<ul style="list-style-type: none"> The DPE is adjusting the communication speed.
10	Degraded/Warning	<ul style="list-style-type: none"> The DPE performance is degraded.
20	Major failure	<ul style="list-style-type: none"> The DPE has a disk drive-type mismatch. The DPE has taken a communication fault. The DPE has faulted. The DPE has a faulted LCC. The DPE has been misconfigured. The DPE has been miscabled. The DPE has been removed. The DPE had taken a power fault. The DPE is connected to a faulted I/O module. The DPE has taken an inter-processor control fault and needs to be recovered. The DPE has taken an inter-processor communication fault and needs to be recovered.

View disk processor enclosure

View details of the system DPE.

Format

```
/env/dpe [-id <value>] show
```


Object qualifier

Qualifier	Description
-id	ID of the DPE.

Example 1 (physical deployments only)

The following command displays the system DPE information:

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

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

1:  ID              = dpe
    Slot            = 0
    Name            = DPE
    Health state     = OK (5)
    Health details   = "The component is operating normally. No action is
required."
    Manufacturer     =
    Model            = BC DPE NO I/O DUAL SP 25 DRV 6C
    Part number      = 100-542-441-03
    Serial number    = FCNBV131000114
    Power (Present)  = 361 watts
    Power (Rolling Average) = 362 watts
    Temperature (Present) = 84° F (29° C)
    Temperature (Rolling Average) = 84° F (29° C)
```

Example 2 (virtual deployments only)

The following command displays the system DPE information:

```
uemcli -d 10.0.0.2 -u Local/joe -p MyPassword456! /env/dpe show -detail
```

```
Storage system address: 10.0.0.2
Storage system port: 443
HTTPS connection

1:  ID              = dpe
    Name            = DPE
    Health state     = OK (5)
    Health details   = "The component is operating normally. No action is
required."
    Manufacturer     = VMware
    Model            = VIRT SINGLE SP DPE 16
```

Manage memory module (physical deployments only)

The following table lists the health state values for system memory modules.

Table 89. Memory module health state values

Code	Health state	Reason(s)
0	Unknown	<ul style="list-style-type: none">The health of the component cannot be determined.
5	OK	<ul style="list-style-type: none">The memory module is operating normally.
20	Major failure	<ul style="list-style-type: none">The memory module has faulted.

Table 89. Memory module health state values (continued)

Code	Health state	Reason(s)
		<ul style="list-style-type: none">The memory module has been removed.

View memory module

View a list of system memory modules.

Format

```
/env/mm [-id <value>] show
```

Object qualifier

Qualifier	Description
-id	ID of the memory module.

Example

The following command displays a list of system memory modules:

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

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection
```

```
1:      ID          = MM_SPA_0
      SP           = SP̄A
      Slot          = 0
      Health state = OK (5)
```

```
2:      ID          = MM_SPA_1
      SP           = SP̄A
      Slot          = 1
      Health state = OK (5)
```

Manage System Status Card (physical deployments only)

The following table lists the health state values for System Status Cards (SSC).

Table 90. SSC health state values

Code	Health state	Reason(s)
0	Unknown	<ul style="list-style-type: none">The health of the component cannot be determined.
5	OK	<ul style="list-style-type: none">The SSC is operating normally.
20	Major failure	<ul style="list-style-type: none">The SSC has faulted.The SSD is missing.

View SSC

View a list of System Status Cards (SSC).

Format

```
/env/ssc [-id <value>] show
```

Object qualifier

Qualifier	Description
-id	ID of the SSC.

Example

The following command displays the details of the system status card.

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /env/ssc show -detail
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

1:  ID          = dae_0_3_ssc
    Enclosure   = dae_0_3
    Slot        = 0
    Name        = DAE 0 3 System Status Card
    Health state = OK (5)
    Health details = "The component is operating normally. No action is required."
    Manufacturer = EMC
    Model        = NAGA 120 DRIVE 12G SAS SSC FRU
    Part number  = 303-340-000C-00
    Serial number = CF2BW162200072
```

Manage fan modules (physical deployments only)

The following table lists the health state values for the system fan modules.

Table 91. System fan module health state values

Code	Health state	Reason(s)
0	Unknown	<ul style="list-style-type: none">The health of the component cannot be determined.
5	OK	<ul style="list-style-type: none">The fan module is operating normally.
10	Degraded/Warning	<ul style="list-style-type: none">The fan module is degraded.
20	Major failure	<ul style="list-style-type: none">The fan module has been removed.The fan module has faulted.

View fan module

View a list of system fan modules.

Format

```
/env/fan [-id <value>] show
```

Object qualifier

Qualifier	Description
-id	Identifies the fan module.

Example

The following command displays a list of system cache cards:

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


```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

1:      ID           = Fan_0
      DPE           = DPE_0
      Slot          = 0
      Health state   = OK (5)

2:      ID           = Fan_1
      DPE           = DPE_0
      Slot          = 1
      Health state   = Degraded/Warning (10)
```

Manage I/O modules, embedded modules, and 4-port cards (physical deployments only)

Depending on the type of component installed, I/O modules, embedded modules and 4-port cards provide connectivity between the SPs and the host, or between the SPs and the disk-array enclosure.

 **NOTE:** Embedded modules and 4-port cards are only available on Unity 480/480F, Unity 680/680F, and Unity 880/880F systems.

You can view details about each I/O module, embedded module, and 4-port card installed in the system, such as the health state. Commit a newly added component to configure it for use by the system. Each component record and alert is identified by an ID. The following table lists the attributes for I/O modules, embedded modules and 4-port cards.

Table 92. Component attributes

Attribute	Description
ID	ID of the I/O module, embedded module, or 4-port card.
SP	ID of the SP to which the I/O module, embedded module, or 4-port card is connected.
Slot	Disk-processor enclosure (DPE) slot in which the I/O module, embedded module, or 4-port card is installed.
Name	Name of the I/O module, embedded module, or 4-port card.
Manufacturer	Manufacturer of the I/O module, embedded module, or 4-port card.
Model	Model of the I/O module, embedded module, or 4-port card.

Table 92. Component attributes (continued)

Attribute	Description
Health state	<p>Health state of the I/O module, embedded module, or 4-port card. The health state code appears in parentheses. Value is one of the following:</p> <ul style="list-style-type: none"> • Unknown (0) — Unable to determine the health of the component. • OK (5) — Component is operating normally. • Degraded/Warning (10) — Component has not been committed (configured). Commit I/O modules, embedded modules, and 4-port cards on page 285 explains how to commit an I/O module, embedded module, or 4-port card. • Minor failure (15) — One or both of the following may have occurred: <ul style="list-style-type: none"> ◦ Component has not been committed (configured) after a rebooting the SP. ◦ Component is installed in the wrong slot. • Major failure (20) — One or more of the following may have occurred: <ul style="list-style-type: none"> ◦ Component has been removed. Re-install the component. ◦ Component has faulted and needs to be replaced. The Unisphere online help explains how to order a replacement component. ◦ Component is misconfigured. Commit the component to re-configure it.
Health details	Additional health information. See Appendix A, Reference, for health information details.
Part number	Part Number on the I/O module, embedded module, or 4-port card.
Serial number	Serial Number on the I/O module, embedded module, or 4-port card.

Commit I/O modules, embedded modules, and 4-port cards

When you add a new I/O module, embedded module, or 4-port card to the system, you must first commit it before the system can use it. The system automatically commits unconfigured I/O modules, embedded modules, or 4-port cards.

Format

```
/env/iomodule commit
```


Example

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

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection
Operation completed successfully.
```

View I/O modules, embedded modules, and 4-port cards

View details about I/O modules, embedded modules, or 4-port cards in the system. You can filter on the component ID.

 **NOTE:** The `show` action command on page 21 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, embedded module, or 4-port card.

Example 1

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
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

1:      ID          = IO_SPA_0
      SP           = SP̄A
      Slot         = 0
      Health state = OK (5)

2:      ID          = IO_SPA_1
      SP           = SP̄A
      Slot         = 1
      Health state = Degraded/Warning (10)
```

Example 2

The following command displays details about an embedded module and 4-port card in a Unity 680 system:

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

```
1:      ID          = spb_iopm_0
      SP           = spb
      Slot         = 0
      Name         = SP B Embedded Module 0
      Health state = OK (5)
      Health details = "The component is operating normally. No action is required."
      Manufacturer =
      Model        = IOPM
      Part number  = 110-452-003C-00
      Serial number = FCNMD184200103

2:      ID          = spb_ocp_0
      SP           = spb
      Slot         = 0
      Name         = SP A 4-Port Card
      Health state = OK (5)
      Health details = "The component is operating normally. No action is required."
      Manufacturer = CELESTICA-CSS
      Model        = OCP Light Blade
```

Part number = 105-001-101-03
Serial number = CETED184300069

Manage Storage

This chapter contains the following topics:


Topics:

- [Configure custom pools](#)
- [Manage pool tiers](#)
- [View pool resources](#)
- [Manage FAST VP general settings](#)
- [Manage FAST Cache \(supported physical deployments only\)](#)
- [Manage FAST Cache storage objects \(physical deployments only\)](#)
- [View storage profiles \(physical deployments only\)](#)
- [Manage drive groups \(physical deployments only\)](#)
- [Manage storage system capacity settings](#)
- [Manage system tier capacity settings](#)
- [Manage file systems](#)
- [Manage user quotas for file systems and quota trees](#)
- [Manage quota trees](#)
- [Manage quota settings](#)
- [Manage NFS network shares](#)
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- [Manage LUNs](#)
- [Manage consistency groups](#)
- [Manage VMware NFS datastores](#)
- [Manage VMware VMFS datastores](#)
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- [Manage VVol datastores](#)
- [Manage VVol objects](#)
- [Manage capability profiles](#)
- [Manage I/O limits](#)
- [Manage I/O limit configuration](#)

Configure custom pools

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

- Type of drive used to provide the storage.
- (dual-SP virtual deployments only) RAID level implemented for the storage.

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

The following table lists the attributes for pools:

Table 93. Custom pool attributes

Attribute	Description
ID	ID of the pool.
Name	Name of the pool.
Type	Pool type. Valid values are:

Table 93. Custom pool attributes (continued)

Attribute	Description
	<ul style="list-style-type: none"> • Dynamic • Traditional
Description	Brief description of the pool.
Total space	Total storage capacity of the pool.
Current allocation	Amount of storage in the pool allocated to storage resources.
Preallocated space	Amount of storage space reserved in the pool by storage resources for future needs to make writes more efficient. The pool may be able to reclaim some of this space if total pool space is running low. This value equals the sum of the <code>sizePreallocated</code> values of each storage resource in the pool.
Remaining space	Amount of storage in the pool not allocated to storage resources.
Subscription	<p>For thin provisioning, the total storage space subscribed to the pool. All 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, pools can be over provisioned to support more storage capacity than they actually possess.</p> <p>i NOTE: The system automatically generates an alert when the total pool usage reaches 85% of the pool's physical capacity. <code>-alertThreshold</code> specifies the alert threshold value.</p>
Subscription percent	For thin provisioning, the percentage of the total space in the 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 drives on the system, including the number of drives of each type, in the pool. If FAST VP is installed, you can mix different types of drives to make a tiered pool. However, SAS Flash 4 drives must be used in a homogeneous pool.
Number of drives	Total number of drives in the pool.
Number of unused drives	Number of drives in the pool that are not being used.
RAID level (physical deployments only)	RAID level of the drives in the pool.
Stripe length (physical deployments only)	Number of drives the data is striped across.
Rebalancing	<p>Indicates whether a pool rebalancing is in progress. Valid values are:</p> <ul style="list-style-type: none"> • yes • no
Rebalancing progress	Indicates the progress of the pool rebalancing as a percentage.
System defined pool	<p>Indication of whether the system configured the pool automatically. Valid values are:</p> <ul style="list-style-type: none"> • yes • no
Health state	<p>Health state of the pool. The health state code appears in parentheses. Valid values are:</p> <ul style="list-style-type: none"> • Unknown (0) - Health is unknown. • OK (5) - Operating normally.

Table 93. Custom pool attributes (continued)

Attribute	Description
	<ul style="list-style-type: none"> • OK BUT (7) - Pool has exceeded its user-specified threshold or the system specified threshold of 85%. • Degraded/Warning (10) - Pool is operating, but degraded due to one or more of the following: <ul style="list-style-type: none"> ◦ Pool has exceeded the user-specified threshold. ◦ Pool is nearing capacity. ◦ Pool is almost full. ◦ Pool performance has degraded. • Major failure (20) - Dirty cache has made the pool unavailable. • Critical failure (25) - Pool is full. To avoid data loss, add more storage to the pool, or create more pools. • Non-recoverable error (30) - Two or more drives in the pool have failed, possibly resulting in data loss.
Health details	Additional health information. See Appendix A, Reference, for health information details.
FAST Cache enabled (physical deployments only)	Indicates whether FAST Cache is enabled on the pool. Valid values are: <ul style="list-style-type: none"> • yes • no
Non-base size used	Quantity of storage used for thin clone and snapshot data.
Auto-delete state	Indicates the state of an auto-delete operation on the pool. Valid values are: <ul style="list-style-type: none"> • Idle • Running • Could not reach LWM • Could not reach HWM <p>NOTE: If the auto-delete operation cannot satisfy the high water mark, and there are snapshots in the pool, the auto-delete operation sets the auto-delete state for that watermark to Could not reach HWM , and generates an alert.</p> <ul style="list-style-type: none"> • Failed
Auto-delete paused	Indicates whether an auto-delete operation is paused. Valid values are: <ul style="list-style-type: none"> • yes • no
Auto-delete pool full threshold enabled	Indicates whether the system will check the pool full high water mark for auto-delete. Valid values are: <ul style="list-style-type: none"> • yes • no
Auto-delete pool full high water mark	The pool full high watermark on the pool.
Auto-delete pool full low water mark	The pool full low watermark on the pool.
Auto-delete snapshot space used threshold enabled	Indicates whether the system will check the snapshot space used high water mark for auto-delete. Valid values are: <ul style="list-style-type: none"> • yes • no
Auto-delete snapshot space used high water mark	High watermark for snapshot space used on the pool.
Auto-delete snapshot space used low water mark	Low watermark for snapshot space used on the pool.

Table 93. Custom pool attributes (continued)

Attribute	Description
Data Reduction space saved (physical deployments only)	Storage size saved on the pool by using data reduction. i NOTE: Data reduction is available for thin LUNs and thin file systems in an All-Flash pool only. The thin file systems must be created on Unity systems running version 4.2.x or later.
Data Reduction percent (physical deployments only)	Storage percentage saved on the pool by using data reduction. i NOTE: Data reduction is available for thin LUNs and thin file systems in an All-Flash pool only. The thin file systems must be created on Unity systems running version 4.2.x or later.
Data Reduction ratio (physical deployments only)	Ratio between data without data reduction and data after data reduction savings. i NOTE: Data reduction is available for thin LUNs and thin file systems in an All-Flash pool only. The thin file systems must be created on Unity systems running version 4.2.x or later.
All flash pool	Indicates whether the pool contains only Flash drives. Valid values are: <ul style="list-style-type: none"> • yes • no

Create pools

Create a dynamic or traditional pool:

- Both traditional pools and dynamic pools are supported in the CLI and REST API for Unity All-Flash models running OE version 4.2.x or later. The default pool type is dynamic.
- Traditional pools are supported in all Unity hybrid and virtual models. They are also supported in Unity All-Flash models running OE version 4.1.x or earlier.

Format

```
/stor/config/pool create [-async] -name <value> [-type {dynamic | traditional}] [-descr <value>] [-diskGroup <value> -drivesNumber <value> [-storProfile <value>] | -disk <value>] [-alertThreshold <value>] [-snapPoolFullThresholdEnabled {yes|no}] [-snapPoolFullHWM <value>] [-snapPoolFullLWM <value>] [-snapSpaceUsedThresholdEnabled {yes|no}] [-snapSpaceUsedHWM <value>] [-snapSpaceUsedLWM <value>]
```

Action qualifier

Qualifier	Description
-async	Run the operation in asynchronous mode. i NOTE: Simultaneous commands, asynchronous or synchronous, may fail if they conflict in trying to manage the same system elements.
-name	Type a name for the pool.
-type	(Available only for systems that support dynamic pools) Specify the type of pool to create. Value is one of the following: <ul style="list-style-type: none"> • dynamic • traditional Default value is dynamic.
-descr	Type a brief description of the pool.

Qualifier	Description
-storProfile (physical deployments only)	Type the ID of the storage profiles, separated by commas, to apply to the pool, based on the type of storage resource that will use the pool and the intended usage of the pool. View storage profiles (physical deployments only) on page 316 explains how to view the IDs of available storage profiles on the system. If this option is not specified, a default RAID configuration is selected for each particular drive type in the selected drive group: NL-SAS (RAID 6 with a stripe length of 8), SAS (RAID 5 with a stripe length of 5), or Flash (RAID 5 with a stripe length of 5).
-diskGroup (physical deployments only)	Type a comma-separated list of IDs of the drive groups to use in the pool. Specifying drive groups with different drive types causes the creation of a multi-tier pool. View drive groups on page 319 explains how to view the IDs of the drive groups on the system.
-drivesNumber (physical deployments only)	Specify the drive numbers, separated by commas, from the selected drive groups to use in the pool. If this option is specified when -storProfile is not specified, the operation may fail when the -drivesNumber value does not match the default RAID configuration for each drive type in the selected drive group.
-disk (virtual deployments only)	Specify the list of drive IDs, separated by commas, to use in the pool. Specified drives must be reliable storage objects that do not require additional protection.
-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%.
-FASTCacheEnabled (physical deployments only)	Specify whether to enable FAST Cache on the pool. Value is one of the following: <ul style="list-style-type: none"> • yes • no Default value is yes.
-snapPoolFullThresholdEnabled	Indicate whether the system should check the pool full high water mark for auto-delete. Value is one of the following: <ul style="list-style-type: none"> • yes • no Default value is yes.
-snapPoolFullHWM	Specify the pool full high watermark for the pool. Valid values are 1-99. Default value is 95.
-snapPoolFullLWM	Specify the pool full low watermark for the pool. Valid values are 0-98. Default value is 85.
-snapSpaceUsedThresholdEnabled	Indicate whether the system should check the snapshot space used high water mark for auto-delete. Value is one of the following: <ul style="list-style-type: none"> • yes • no Default value is yes.
-snapSpaceUsedHWM	Specify the snapshot space used high watermark to trigger auto-delete on the pool. Valid values are 1-99. Default value is 95.
-snapSpaceUsedLWM	Specify the snapshot space used low watermark to trigger auto-delete on the pool. Valid values are 0-98. Default value is 20.

NOTE: Use the [Change disk settings \(virtual deployments only\)](#) on page 274 command to change the assigned tiers for specific drives.

Example 1 (physical deployments only)

The following command creates a dynamic pool. This example uses storage profiles `profile_1` and `profile_2`, six drives from drive group `dg_2`, and ten drives from drive group `dg_28`. The configured pool receives ID `pool_2`.

NOTE: Before using the `stor/config/pool create` command, use the `/stor/config/profile show` command to display the dynamic pool profiles and the `/stor/config/dg show` command to display the drive groups.

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! uemcli /stor/config/pool create -
name MyPool -descr "dynamic pool" -diskGroup dg_2,dg_28 -drivesNumber 6,10 -storProfile
profile_1,profile_2
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection
```

```
ID = pool_2
Operation completed successfully.
```

Example 2 (physical deployments only)

The following command creates a traditional pool in models that support dynamic pools. This example uses storage profiles `tprofile_1` and `tprofile_2`, five drives from drive group `dg_3`, and nine drives from drive group `dg_28`. The configured pool receives ID `pool_6`.

NOTE: Before using the `stor/config/pool create` command, use the `/stor/config/profile -traditional show` command to display the traditional pool profiles (which start with "t") and the `/stor/config/dg show` command to display the drive groups.

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /stor/config/pool create -name
MyPool -descr "traditional pool" -diskGroup dg_3,dg_28 -drivesNumber 5,9 -storProfile
tprofile_1,tprofile_2 -type traditional
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection
```

```
ID = pool_6
Operation completed successfully.
```

Example 3 (physical deployments only)

The following command creates a traditional pool in models that do not support dynamic pools. This example uses storage profiles `profile_19` and `profile_20`, five drives from drive group `dg_15`, and nine drives from drive group `dg_16`. The configured pool receives ID `pool_5`.

NOTE: Before using the `stor/config/pool create` command, use the `/stor/config/profile show` command to display the traditional pool profiles and the `/stor/config/dg show` command to display the drive groups.

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /stor/config/pool create -name MyPool -
descr "my big pool" -storProfile profile_19,profile_20 -diskGroup dg_15,dg_16 -drivesNumber
5,9 -FASTCacheEnabled yes
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection
```

```
ID = pool_5
Operation completed successfully.
```

Example 4 (virtual deployments only)

The following command creates a traditional pool with two virtual disks, vdisk_0 and vdisk_2 in the Extreme Performance tier. The configured pool receives ID pool_4.

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /stor/config/pool create -name vPool -  
descr "my virtual pool" -disk vdisk_0,vdisk_2
```

```
Storage system address: 10.0.0.1  
Storage system port: 443  
HTTPS connection
```

```
ID = pool_4  
Operation completed successfully.
```

Change pool settings

Change the subscription alert threshold, FAST Cache, and snapshot threshold settings for a pool.


Format

```
/stor/config/pool {-id <value> | -name <value>} set [-async] -name <value> [-  
descr <value>] [-alertThreshold <value>] [-snapPoolFullThresholdEnabled {yes|no}] [-  
snapPoolFullHWM <value>] [-snapPoolFullLWM <value>] [-snapSpaceUsedThresholdEnabled {yes|  
no}] [-snapSpaceUsedHWM <value>] [-snapSpaceUsedLWM <value>] [-snapAutoDeletePaused no]
```

Object qualifiers

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

Action qualifier

Qualifier	Description
-async	Run the operation in asynchronous mode.  NOTE: Simultaneous commands, asynchronous or synchronous, may fail if they conflict in trying to manage the same system elements.
-name	Type a name for the pool.
-descr	Type a brief description of the 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 84%.
-FASTCacheEnabled (physical deployments only)	Specify whether to enable FAST Cache on the pool. Value is one of the following: <ul style="list-style-type: none">• yes• no
-snapPoolFullThresholdEnabled	Indicate whether the system should check the pool full high water mark for auto-delete. Value is one of the following: <ul style="list-style-type: none">• yes• no

Qualifier	Description
-snapPoolFullHWM	Specify the pool full high watermark for the pool. Valid values are 1–99. Default value is 95.
-snapPoolFullLWM	Specify the pool full low watermark for the pool. Valid values are 0–98. Default value is 85.
-snapSpaceUsedThresholdEnabled	Indicate whether the system should check the snapshot space used high watermark for auto-delete. Value is one of the following: <ul style="list-style-type: none"> • yes • no
-snapSpaceUsedHWM	Specify the snapshot space used high watermark to trigger auto-delete on the pool. Valid values are 1–99. Default value is 95.
-snapSpaceUsedLWM	Specify the snapshot space used low watermark to trigger auto-delete on the pool. Valid values are 0–98. Default value is 20.
-snapAutoDeletePaused	Specify whether to pause snapshot auto-delete. Typing no resumes the auto-delete operation.

Example

The following command sets the subscription alert threshold for pool pool_1 to 70%:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /stor/config/pool -id pool_1 -set -alertThreshold 70 -FASTCacheEnabled no
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection
```

```
ID = pool_1
Operation completed successfully.
```

Add drives to pools

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

Format

```
/stor/config/pool {-id <value> | -name <value>} extend [-async] {-diskGroup <value> -drivesNumber <value> [-storProfile <value>] |-disk <value>}
```

Object qualifiers

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

Action qualifier

Qualifier	Description
-async	Run the operation in asynchronous mode.

Qualifier	Description
-diskGroup (physical deployments only)	Type the IDs of the drive groups, separated by commas, to add to the pool.
-drivesNumber (physical deployments only)	Type the number of drives from the specified drive groups, separated by commas, to add to the pool. If this option is specified when -storProfile is not specified, the operation may fail when the -drivesNumber value does not match the default RAID configuration for each drive type in the selected drive group.
-storProfile (physical deployments only)	Type the IDs of the storage profiles, separated by commas, to apply to the pool. If this option is not specified, a default RAID configuration is selected for each particular drive type in the selected drive group: NL-SAS (RAID 6 with a stripe length of 8), SAS (RAID 5 with a stripe length of 5), or Flash (RAID 5 with a stripe length of 5).
-disk (virtual deployments only)	Specify the list of drives, separated by commas, to add to the pool. Specified drives must be reliable storage objects that do not require additional protection.

Example 1 (physical deployments only)

The following command extends pool pool_1 with seven drives from drive group DG_1:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /stor/config/pool -id pool_1 extend -diskGroup dg_1 -drivesNumber 7 -storProfile profile_12
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

ID = pool_1
Operation completed successfully.
```

Example 2 (virtual deployments only)

The following command extends pool pool_1 by adding two virtual disks, vdisk_1 and vdisk_5.

```
uemcli -d 10.0.0.2 -u Local/joe -p MyPassword456! /stor/config/pool -id pool_1 extend -disk vdisk_1,vdisk_5
```

```
Storage system address: 10.0.0.2
Storage system port: 443
HTTPS connection

ID = pool_1
Operation completed successfully.
```

View pools

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

 **NOTE:** The `show` action command on page 21 explains how to change the output format.

Format

```
/stor/config/pool {-id <value> | -name <value>}] show
```


Object qualifiers

Qualifier	Description
-id	Type the ID of a pool.
-name	Type the name of a pool.

Example 1 (physical deployments only)

The following command shows details about all pools on a hybrid system:

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

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection
```

```
1:      ID                               = pool_1
      Name                               = Performance
      Description                         = Multi-tier pool
      Total space                         = 8663754342400 (7.8T)
      Current allocation                  = 0
      Preallocated space                  = 38310387712 (35.6G)
      Remaining space                     = 8663754342400 (7.8T)
      Subscription                        = 0
      Subscription percent                 = 0%
      Alert threshold                     = 70%
      Drives                             = 5 x 600.0G SAS; 5 x 1.6T SAS
Flash 3
      Number of drives                   = 10
      RAID level                         = 5
      Stripe length                       = 5
      Rebalancing                        = no
      Rebalancing progress                =
      Health state                       = OK (5)
      Health details                     = "The component is operating
normally. No action is required."
      FAST Cache enabled                  = no
      Protection size used                = 0
      Non-base size used                  = 0
      Auto-delete state                   = Idle
      Auto-delete paused                  = no
      Auto-delete pool full threshold enabled = yes
      Auto-delete pool full high water mark = 95%
      Auto-delete pool full low water mark  = 85%
      Auto-delete snapshot space used threshold enabled = no
      Auto-delete snapshot space used high water mark = 25%
      Auto-delete snapshot space used low water mark = 20%
      Compression space saved              = 0
      Compression Percent                  = 0%
      Compression Ratio                    = 1:1
      Data Reduction space saved            = 0
      Data Reduction percent                = 0%
      Data Reduction ratio                  = 1:1
      All flash pool                       = no

2:      ID                               = pool_2
      Name                               = Capacity
      Description                         =
      Total space                         = 4947802324992 (4.5T)
      Current allocation                  = 3298534883328 (3T)
      Preallocated space                  = 22194823168 (20.6G)
      Remaining space                     = 4947802324992 (1.5T)
      Subscription                        = 10995116277760 (10T)
      Subscription percent                 = 222%
      Alert threshold                     = 70%
      Drives                             = 12 x 2TB NL-SAS
      Number of drives                    = 12
```

```

Unused drives = 7
RAID level = 6
Stripe length = 6
Rebalancing = yes
Rebalancing progress = 46%
Health state = OK (5)
Health details = "The component is operating
normally. No action is required."
FAST Cache enabled = yes
Protection size used = 10995116238 (10G)
Non-base size used = 10995116238 (10G)
Auto-delete state = Running
Auto-delete paused = no
Auto-delete pool full threshold enabled = yes
Auto-delete pool full high water mark = 95%
Auto-delete pool full low water mark = 85%
Auto-delete snapshot space used threshold enabled = yes
Auto-delete snapshot space used high water mark = 25%
Auto-delete snapshot space used low water mark = 20%
Compression space saved = 4947802324992 (1.5T)
Compression percent = 23%
Compression ratio = 1.3:1
Data Reduction space saved = 4947802324992 (1.5T)
Data Reduction percent = 23%
Data Reduction ratio = 1.3:1
All flash pool = no

3: ID = pool_3
Name = Extreme Performance
Description =
Total space = 14177955479552 (12.8T)
Current allocation = 0
Preallocated space = 14177955479552 (12.8T)
Remaining space = 14177955479552 (12.8T)
Subscription = 0
Subscription percent = 0%
Alert threshold = 70%
Drives = 9 x 1.6T SAS Flash 3; 5 x
400.0G SAS Flash 2
Number of drives = 14
RAID level = 5
Stripe length = Mixed
Rebalancing = no
Rebalancing progress =
Health state = OK (5)
Health details = "The component is operating
normally. No action is required."
FAST Cache enabled = no
Protection size used = 0
Non-base size used = 0
Auto-delete state = Idle
Auto-delete paused = no
Auto-delete pool full threshold enabled = yes
Auto-delete pool full high water mark = 95%
Auto-delete pool full low water mark = 85%
Auto-delete snapshot space used threshold enabled = no
Auto-delete snapshot space used high water mark = 25%
Auto-delete snapshot space used low water mark = 20%
Compression space saved = 0
Compression Percent = 0%
Compression Ratio = 1:1
Data Reduction space saved = 0
Data Reduction percent = 0%
Data Reduction ratio = 1:1
All flash pool = yes

```

Example 2

The following example shows all pools for a model that supports dynamic pools.

```
uemcli -d 10.0.0.2 -u Local/joe -p MyPassword456! /stor/config/pool show -detail
```

```
[Response]
Storage system address: 10.64.75.201
Storage system port: 443
HTTPS connection
1: ID = pool_3
   Type = Traditional
   Name = MyPool
   Description = traditional pool
   Total space = 14177955479552 (12.8T)
   Current allocation = 0
   Preallocated space = 38310387712 (35.6G)
   Remaining space = 14177955479552 (12.8T)
   Subscription = 0
   Subscription percent = 0%
   Alert threshold = 70%
   Drives = 9 x 1.6T SAS Flash 3; 5 x
400.0G SAS Flash 2
   Number of drives = 14
   RAID level = 5
   Stripe length = Mixed
   Rebalancing = no
   Rebalancing progress =
   Health state = OK (5)
   Health details = "The component is operating
normally. No action is required."
   FAST Cache enabled = no
   Protection size used = 0
   Non-base size used = 0
   Auto-delete state = Idle
   Auto-delete paused = no
   Auto-delete pool full threshold enabled = yes
   Auto-delete pool full high water mark = 95%
   Auto-delete pool full low water mark = 85%
   Auto-delete snapshot space used threshold enabled = no
   Auto-delete snapshot space used high water mark = 25%
   Auto-delete snapshot space used low water mark = 20%
   Compression space saved = 0
   Compression Percent = 0%
   Compression Ratio = 1:1
   Data Reduction space saved = 0
   Data Reduction percent = 0%
   Data Reduction ratio = 1:1
   All flash pool = yes

2: ID = pool_4
   Type = Dynamic
   Name = dynamicPool
   Description =
   Total space = 1544309178368 (1.4T)
   Current allocation = 0
   Preallocated space = 38310387712 (35.6G)
   Remaining space = 1544309178368 (1.4T)
   Subscription = 0
   Subscription percent = 0%
   Alert threshold = 70%
   Drives = 6 x 400.0G SAS Flash 2
   Number of drives = 6
   RAID level = 5
   Stripe length = 5
   Rebalancing = no
   Rebalancing progress =
   Health state = OK (5)
   Health details = "The component is operating
normally. No action is required."
   Protection size used = 0
   Non-base size used = 0
   Auto-delete state = Idle
   Auto-delete paused = no
   Auto-delete pool full threshold enabled = yes
   Auto-delete pool full high water mark = 95%
   Auto-delete pool full low water mark = 85%
```

```

Auto-delete snapshot space used threshold enabled = no
Auto-delete snapshot space used high water mark   = 25%
Auto-delete snapshot space used low water mark    = 20%
Compression space saved                           = 0
Compression Percent                               = 0%
Compression Ratio                                 = 1:1
Data Reduction space saved                         = 0
Data Reduction percent                            = 0%
Data Reduction ratio                              = 1:1
All flash pool                                    = yes

```

Example 3 (virtual deployments only)

The following command shows details for all pools on a virtual system.

```
uemcli -d 10.0.0.2 -u Local/joe -p MyPassword456! /stor/config/pool show -detail
```

```

Storage system address: 10.0.0.2
Storage system port: 443
HTTPS connection

1:      ID                               = pool_1
      Name                             = Capacity
      Description                       =
      Total space                       = 4947802324992 (4.5T)
      Current allocation                 = 3298534883328 (3T)
      Preallocated space                 = 38310387712 (35.6G)
      Remaining space                   = 4947802324992 (1.5T)
      Subscription                       = 10995116277760 (10T)
      Subscription percent               = 222%
      Alert threshold                   = 70%
      Drives                            = 1 x 120GB Virtual; 1 x 300GB

Virtual
      Number of drives                  = 2
      Health state                      = OK (5)
      Health details                    = "The component is operating
normally. No action is required."
      Non-base size used                 = 1099511625 (1G)
      Auto-delete state                  = Running
      Auto-delete paused                 = no
      Auto-delete pool full threshold enabled = yes
      Auto-delete pool full high water mark   = 95%
      Auto-delete pool full low water mark    = 85%
      Auto-delete snapshot space used threshold enabled = yes
      Auto-delete snapshot space used high water mark   = 25%
      Auto-delete snapshot space used low water mark    = 20%

```

Delete pools

Delete a pool.


Format

```
/stor/config/pool {-id <value> | -name <value>} delete [-async]
```

Object qualifiers

Qualifier	Description
-id	Type the ID of the pool to delete.
-name	Type the name of the pool to delete.

Action qualifier

Qualifier	Description
-async	Run the operation in asynchronous mode.  NOTE: Simultaneous commands, asynchronous or synchronous, may fail if they conflict in trying to manage the same system elements.

Example

The following deletes pool pool_1:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /stor/config/pool -id pool_1 delete
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

Operation completed successfully.
```

Manage FAST VP pool settings


Fully Automated Storage Tiering for Virtual Pools (FAST VP) is a storage efficiency technology that automatically moves data between storage tiers within a pool based on data access patterns.

The following table lists the attributes for FAST VP pool settings.

Table 94. FAST VP pool attributes

Attribute	Description
Pool	Identifies the pool.
Status	Identifies the status of data relocation on the pool. Value is one of the following: <ul style="list-style-type: none">• Not started - Data relocation has not started.• Paused - Data relocation is paused.• Completed - Data relocation is complete.• Stopped by user - Data relocation was stopped by the user.• Active - Data relocation is in progress.• Failed - Data relocation failed.
Relocation type	Type of data relocation. Value is one of the following: <ul style="list-style-type: none">• Manual - Data relocation was initiated by the user.• Scheduled or rebalancing - Data relocation was initiated by the system because it was scheduled, or because the system rebalanced the data.
Schedule enabled	Identifies whether the pool is rebalanced according to the system FAST VP schedule. Value is one of the following: <ul style="list-style-type: none">• yes• no
Start time	Indicates the time the current data relocation started.
End time	Indicates the time the current data relocation is scheduled to end.
Data relocated	The amount of data relocated during an ongoing relocation, or the previous relocation if a data relocation is not occurring. The format is: <value> [suffix] where: <ul style="list-style-type: none">• value - Identifies the size of the data relocated.

Table 94. FAST VP pool attributes (continued)

Attribute	Description
	<ul style="list-style-type: none"> <code>suffix</code> - Identifies that the value relates to the previous relocation session.
Rate	<p>Identifies the transfer rate for the data relocation. Value is one of the following:</p> <ul style="list-style-type: none"> <code>Low</code> - Least impact on system performance. <code>Medium</code> - Moderate impact on system performance. <code>High</code> - Most impact on system performance. <p>Default value is medium.</p> <p> NOTE: This field is blank if data relocation is not in progress.</p>
Data to move up	The amount of data in the pool scheduled to be moved to a higher storage tier.
Data to move down	The amount of data in the pool scheduled to be moved to a lower storage tier.
Data to move within	The amount of data in the pool scheduled to be moved within the same storage tiers for rebalancing.
Data to move up per tier	<p>The amount of data per tier that is scheduled to be moved to a higher tier. The format is:</p> <p><code><tier_name>:[value]</code></p> <p>where:</p> <ul style="list-style-type: none"> <code>tier_name</code> - Identifies the storage tier. <code>value</code> - Identifies the amount of data in that tier to be move up.
Data to move down per tier	<p>The amount of data per tier that is scheduled to be moved to a lower tier. The format is:</p> <p><code><tier_name>:[value]</code></p> <p>where:</p> <ul style="list-style-type: none"> <code>tier_name</code> - Identifies the storage tier. <code>value</code> - Identifies the amount of data in that tier to be moved down.
Data to move within per tier	<p>The amount of data per tier that is scheduled to be moved to within the same tier for rebalancing. The format is:</p> <p><code><tier_name>:[value]</code></p> <p>where:</p> <ul style="list-style-type: none"> <code>tier_name</code> - Identifies the storage tier. <code>value</code> - Identifies the amount of data in that tier to be rebalanced.
Estimated relocation time	Identifies the estimated time required to perform the next data relocation.

Change FAST VP pool settings

Modify FAST VP settings on an existing pool.

Format


```
/stor/config/pool/fastvp {-pool <value> | -poolName <value>} set [-async] -schedEnabled {yes | no}
```

Object qualifiers

Qualifier	Description
<code>-pool</code>	Type the ID of the pool.

Qualifier	Description
-poolName	Type the name of the pool.

Action qualifier

Qualifier	Description
-async	Run the operation in asynchronous mode.  NOTE: Simultaneous commands, asynchronous or synchronous, may fail if they conflict in trying to manage the same system elements.
-schedEnabled	Specify whether the pool is rebalanced according to the system FAST VP schedule. Value is one of the following: <ul style="list-style-type: none"> • yes • no

Example

The following example enables the rebalancing schedule on pool pool_1:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /stor/config/pool/fastvp -pool pool_1 set -schedEnabled yes
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection
```

```
Pool ID = pool_1
Operation completed successfully.
```

View FAST VP pool settings

View FAST VP settings on a pool.

Format

```
/stor/config/pool/fastvp [{-pool <value> | -poolName <value>}] show
```

Object qualifiers

Qualifier	Description
-pool	Type the ID of the pool.
-poolName	Type the name of the pool.

Example

The following command lists the FAST VP settings on the storage system:

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

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection
```

```
1: Pool                      = pool_1
   Relocation type          = manual
```

```

Status = Active
Schedule enabled = no
Start time = 2013-09-20 12:55:32
End time = 2013-09-20 21:10:17
Data relocated = 100111454324 (100G)
Rate = high
Data to move up = 4947802324992 (4.9T)
Data to move down = 4947802324992 (4.9T)
Data to move within = 4947802324992 (4.9T)
Data to move up per tier = Performance: 500182324992 (500G), Capacity:
1000114543245 (1.0T)
Data to move down per tier = Extreme Performance: 1000114543245 (1.0T),
Performance: 500182324992 (500G)
Data to move within per tier = Extreme Performance: 500182324992 (500G),
Performance: 500182324992 (500G), Capacity: 500182324992 (500G)
Estimated relocation time = 7h 30m

```

Start data relocation

Start data relocation on a pool.

Format

```


/stor/config/pool/fastvp {-pool <value> | -poolName <value>} start [-async] [-rate {low |
medium | high}] [-endTime <value>]

```

Object qualifiers

Qualifier	Description
-pool	Type the ID of the pool to resume data relocation.
-poolName	Type the name of the pool to resume data relocation.

Action qualifier

Qualifier	Description
-async	Run the operation in asynchronous mode.  NOTE: Simultaneous commands, asynchronous or synchronous, may fail if they conflict in trying to manage the same system elements.
-pool	Type the ID of the pool.
-endTime	Specify the time to stop the data relocation. The format is: [HH:MM] where: <ul style="list-style-type: none"> • HH — Hour. • MM — Minute. Default value is eight hours from the current time.
-rate	Specify the transfer rate for the data relocation. Value is one of the following: <ul style="list-style-type: none"> • Low — Least impact on system performance. • Medium — Moderate impact on system performance. • High — Most impact on system performance. Default value is the value set at the system level.

Example

The following command starts data relocation on pool pool_1, and directs it to end at 04:00:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /stor/config/pool/fastvp -pool pool_1
start -endTime 04:00
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

Operation completed successfully.
```

Stop data relocation

Stop data relocation on a pool.

Format

```
/stor/config/pool/fastvp {-pool <value> | -poolName <value>} stop [-async]
```

Object qualifiers

Qualifier	Description
-pool	Type the ID of the pool.
-poolName	Type the name of the pool.

Action qualifier

Qualifier	Description
-async	Run the operation in asynchronous mode.

Example

The following command stops data relocation on pool pool_1:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /stor/config/pool/fastvp -pool pool_1
stop
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

Operation completed successfully.
```

Manage pool tiers

Storage tiers allow users to move data between different types of drives in a pool to maximize storage efficiency. Storage tiers are defined by the following characteristics:

- Drive performance.
- Drive capacity.

The following table lists the attributes for storage profiles:

Table 95. Storage tier attributes

Attribute	Description
Name	Storage tier name.
Drives	The list of drive types, and the number of drives of each type in the storage tier.
RAID level (physical deployments only)	RAID level of the storage tier.
Stripe length (physical deployments only)	Comma-separated list of the stripe length of the drives in the storage tier.
Total space	Total capacity in the storage tier.
Current allocation	Currently allocated space.
Remaining space	Remaining space.

View storage tiers

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

 **NOTE:** The `show` action command on page 21 explains how to change the output format.

Format

```
/stor/config/pool/tier {-pool <value> | -poolName <value>} show
```

Object qualifiers

Qualifier	Description
-pool	Type the ID of a pool.
-poolName	Type the name of a pool.

Example 1 (physical deployments only)

The following command shows tier details about the specified pool:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /stor/config/pool/tier -pool pool_1 show -detail
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

1:   Name           = Extreme Performance
     Drives        = 2 x 200.0G SAS Flash 2; 2 x 800.0G SAS Flash 2
     Drive type     = SAS Flash
     RAID level     = 10
     Stripe length  = 2
     Total space    = 868120264704 (808.5G)
     Current allocation = 56371445760 (52.5G)
     Remaining space = 811748818944 (756.0G)

2:   Name           = Performance
     Drives        = 15 x 600.0G SAS
     Drive type     = SAS
     RAID level     = 5
     Stripe length  = 5
     Total space    = 7087501344768 (6.4T)
     Current allocation = 0
```

```

    Remaining space      = 7087501344768 (6.4T)

3:   Name                = Capacity
     Drives              = 8 x 6.0T NL-SAS
     Drive type          = NL-SAS
     RAID level          = 6
     Stripe length       = 8
     Total space         = 35447707271168 (32.2T)
     Current allocation  = 1610612736 (1.5G)
     Remaining space     = 35446096658432 (32.2T)

```

Example 2 (virtual deployments only)

The following command shows details about pool pool_1 on a virtual system.

```
uemcli -d 10.0.0.2 -u Local/joe -p MyPassword456! /stor/config/pool/tier -pool pool_1 show -detail
```

```

Storage system address: 10.0.0.2
Storage system port: 443
HTTPS connection

1:   Name                = Extreme Performance
     Drives              =
     Total space         = 0
     Current allocation  = 0
     Remaining space     = 0

2:   Name                = Performance
     Drives              = 1 x 500GB Virtual
     Total space         = 631242752000 (500.0G)
     Current allocation  = 12624855040 (10.0G)
     Remaining space     = 618617896960 (490.0G)

3:   Name                = Capacity
     Drives              =
     Total space         = 0
     Current allocation  = 0
     Remaining space     = 0

```

View pool resources

This command displays a list of storage resources allocated in a pool. This can be storage resources provisioned on the specified pool and NAS servers that have file systems allocated in the pool.

The following table lists the attributes for pool resources.

Table 96. Pool resources

Attribute	Description
ID	Storage resource identifier.
Name	Name of the storage resource.
Resource type	Type of the resource. Valid values are: <ul style="list-style-type: none"> • LUN • File system • LUN group • VMware NFS • VMware VMFS • NAS server
Pool	Name of the pool.

Table 96. Pool resources (continued)

Attribute	Description
Total pool space used	Total space in the pool used by a storage resource. This includes primary data used size, snapshot used size, and metadata size. Space in the pool can be freed if snapshots and thin clones for storage resources are deleted, or have expired.
Total pool space preallocated	Total space reserved from the pool by the storage resource for future needs to make writes more efficient. The pool may be able to reclaim some of this if space is running low. Additional pool space can be freed if snapshots or thin clones are deleted or expire, and also if Data Reduction is applied.
Total pool non-base space used	Total pool space used by snapshots and thin clones.
Health state	Health state of the file system. The health state code appears in parentheses.
Health details	Additional health information. See Appendix A, Reference, for health information details.

Format

```
/stor/config/pool/sr [{-pool <value> | -poolName <value>}] show
```

Object qualifiers

Qualifier	Description
-pool	Type the ID of the pool.
-poolName	Type the name of the pool.

Example

The following command shows details for all storage resources associated with the pool pool_1:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /stor/config/pool/sr -pool pool_1 show -detail
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

1:      ID              = res_1
      Name              = File_System_1
      Resource type      = File_System
      Pool              = pool_1
      Total pool space used = 53024473088 (49.3G)
      Total pool preallocated = 15695003648 (14.6G)
      Total pool snapshot space used = 7179124736 (6.6G)
      Total pool non-base space used = 7179124736 (6.6G)
      Health state        = OK (5)
      Health details      = "The component is operating normally. No
action is required."

2:      ID              = sv_1
      Name              = AF_LUN_1
      Resource type      = LUN
      Pool              = pool_1
      Total pool space used = 14448566272 (13.4G)
      Total pool preallocated = 4610351104 (4.2G)
```

```

Total pool snapshot space used = 4593991680 (4.2G)
Total pool non-base space used = 4593991680 (4.2G)
Health state                    = OK (5)
Health details                  = "The LUN is operating normally. No action is
required."

3:      ID                      = res_2
      Name                     = File_System_2
      Resource type             = File_System
      Pool                      = pool_1
      Total pool space used     = 117361025024 (109.3G)
      Total pool preallocated   = 3166494720 (2.9G)
      Total pool snapshot space used = 41022308352 (38.2G)
      Total pool non-base space used = 41022308352 (38.2G)
      Health state              = OK (5)
      Health details            = "The component is operating normally. No
action is required."

4:      ID                      = sv_2
      Name                     = AF LUN 2
      Resource type             = LUN
      Pool                      = pool_1
      Total pool space used     = 9500246016 (8.8G)
      Total pool preallocated   = 2579349504 (2.4G)
      Total pool snapshot space used = 0
      Total pool non-base space used = 0
      Health state              = OK (5)
      Health details            = "The LUN is operating normally. No action is
required."

5:      ID                      = res_3
      Name                     = CG1
      Resource type             = LUN group
      Pool                      = pool_1
      Total pool space used     = 892542287872 (831.2G)
      Total pool preallocated   = 8863973376 (8.2G)
      Total pool snapshot space used = 231799308288 (215.8G)
      Total pool non-base space used = 231799308288 (215.8G)
      Health state              = OK (5)
      Health details            = "The component is operating normally. No
action is required."

```

Manage FAST VP general settings


Fully Automated Storage Tiering for Virtual Pools (FAST VP) is a storage efficiency technology that automatically moves data between storage tiers within a pool based on data access patterns.

The following table lists the attributes for FAST VP general settings.

Table 97. FAST VP general attributes

Attribute	Description
Paused	Identifies whether the data relocation is paused. Value is one of the following: <ul style="list-style-type: none"> yes no
Schedule-enabled	Identifies whether the pool is rebalanced according to the system FAST VP schedule. Value is one of the following: <ul style="list-style-type: none"> yes no
Frequency	Data relocation schedule. The format is: Every <days_of_the_week> at <start_time> until <end_time> where: <ul style="list-style-type: none"> <days_of_the_week> - List of the days of the week that data relocation will run.

Table 97. FAST VP general attributes (continued)

Attribute	Description
	<ul style="list-style-type: none"> • <code><start_time></code> - Time the data relocation starts. • <code><end_time></code> - Time the data relocation finishes.
Rate	<p>Identifies the transfer rate for the data relocation. Value is one of the following:</p> <ul style="list-style-type: none"> • Low - Least impact on system performance. • Medium - Moderate impact on system performance. • High - Most impact on system performance. <p>Default value is medium.</p> <p> NOTE: This field is blank if data relocation is not in progress.</p>
Data to move up	The amount of data in the pool scheduled to be moved to a higher storage tier.
Data to move down	The amount of data in the pool scheduled to be moved to a lower storage tier.
Data to move within	The amount of data in the pool scheduled to be moved within the same storage tiers for rebalancing.
Estimated scheduled relocation time	Identifies the estimated time required to perform the next data relocation.

Change FAST VP general settings

Change FAST VP general settings.

Format

```
/stor/config/fastvp set [-async] [-schedEnabled {yes | no}] [-days <value>] [-at <value>]
[-until <value>] [-rate {low | medium | high}] [-paused {yes | no}]
```

Action qualifier

Qualifier	Description
-async	Run the operation in asynchronous mode.
-paused	<p>Specify whether to pause data relocation on the storage system. Valid values are:</p> <ul style="list-style-type: none"> • yes • no
-schedEnabled	<p>Specify whether the pool is rebalanced according to the system FAST VP schedule. Valid values are:</p> <ul style="list-style-type: none"> • yes • no
-days	<p>Specify a comma-separated list of the days of the week to schedule data relocation. Valid values are:</p> <ul style="list-style-type: none"> • mon - Monday • tue - Tuesday • wed - Wednesday • thu - Thursday • fri - Friday • sat - Saturday • sun - Sunday
-at	<p>Specify the time to start the data relocation. The format is:</p> <p>[HH:MM]</p> <p>where:</p>

Qualifier	Description
	<ul style="list-style-type: none"> • HH – Hour • MM – Minute Valid values are between 00:00 and 23:59. Default value is 00:00.
-until	Specify the time to stop the data relocation. The format is: [HH:MM] where: <ul style="list-style-type: none"> • HH – Hour • MM – Minute Valid values are between 00:00 and 23:59. Default value is eight hours after the time specified with the -at parameter.
-rate	Specify the transfer rate for the data relocation. Value is one of the following: <ul style="list-style-type: none"> • low – Least impact on system performance. • medium – Moderate impact on system performance. • high – Most impact on system performance. Default value is medium.

Example

The following command changes the data relocation schedule to run on Mondays and Fridays from 23:00 to 07:00:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /stor/config/fastvp set -schedEnabled yes -days "Mon,Fri" -at 23:00 -until 07:00
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection
Operation completed successfully.
```

View FAST VP general settings

View the FAST VP general settings.

Format

```
/stor/config/fastvp show -detail
```

Example

The following command displays the FAST VP general settings:

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

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

1: Paused                                = no
   Schedule enabled                       = yes
   Frequency                             = Every Mon, Fri at 22:30 until 8:00
   Rate                                  = high
   Data to move up                       = 4947802324992 (1.5T)
   Data to move down                     = 4947802324992 (1.5T)
   Data to move within                   = 4947802324992 (1.5T)
   Estimated scheduled relocation time = 7h 30m
```

Manage FAST Cache (supported physical deployments only)

FAST Cache is a storage efficiency technology that uses drives to expand the cache capability of the storage system to provide improved performance.

The following table lists the attributes for FAST Cache:

Table 98. FAST Cache attributes

Attribute	Description
Capacity	Capacity of the FAST Cache.
Drives	The list of drive types, and the number of drives of each type in the FAST Cache.
Number of drives	Total number of drives in the FAST Cache.
RAID level	RAID level applied to the FAST Cache drives. This value is always RAID 1 .
Health state	Health state of the FAST Cache. The health state code appears in parentheses.
Health details	Additional health information. See Appendix A, Reference, for health information details.


Create FAST Cache

Configure FAST Cache. The storage system generates an error if FAST Cache is already configured.

Format

```
/stor/config/fastcache create [-async] -diskGroup <value> -drivesNumber <value> [-enableOnExistingPools {yes | no}]
```

Action qualifier

Qualifier	Description
-async	Run the operation in asynchronous mode.
-diskGroup	Specify the drive group to include in the FAST Cache.  NOTE: Only SAS Flash 2 drives can be used in the FAST Cache.
-drivesNumber	Specify the number of drives to include in the FAST Cache.
-enableOnExistingPools	Specify whether FAST Cache is enabled on all existing pools. Valid values are: <ul style="list-style-type: none">• yes• no

Example

The following command configures FAST Cache with six drives from drive group dg_2, and enables FAST Cache on existing pools:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /stor/config/fastcache create -diskGroup dg_2 -drivesNumber 6 -enableOnExistingPools yes
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection
```


Operation completed successfully.

View FAST Cache settings

View the FAST Cache parameters.

Format

```
/stor/config/fastcache show
```

Example

The following command displays the FAST Cache parameters for a medium endurance Flash drive:

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

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

1:      Total space           = 536870912000 (500G)
        Drives                = 6 x 200GB SAS Flash 2
        Number of drives      = 6
        RAID level            = 1
        Health state          = OK (5)
        Health details        = "The component is operating normally. No action is
required."
```

Extend FAST Cache

Extend the FAST Cache by adding more drives.

Format

```
/stor/config/fastcache extend [-async] -diskGroup <value> -drivesNumber <value>
```

Action qualifier

Qualifier	Description
-async	Run the operation in asynchronous mode.
-diskGroup	Specify the comma-separated list of SAS Flash drives to add to the FAST Cache. Any added drives must have the same drive type and drive size as the existing drives.
-drivesNumber	Specify the number of drives for each corresponding drive group to be added to the FAST Cache.

Example

The following command adds six drives from drive group "dg_2" to FAST cache.

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /stor/config/fastcache extend -diskGroup dg_2 -drivesNumber 6
```

```
Storage system address: 10.0.0.1
Storage system port: 443
```

HTTPS connection

Operation completed successfully.

Shrink FAST Cache

Shrink the FAST Cache by removing storage objects.

Format

```
/stor/config/fastcache shrink [-async] -so <value>
```

Action qualifier

Qualifier	Description
-async	Run the operation in asynchronous mode.
-so	Specify the comma-separated list of storage objects to remove from the FAST Cache. Run the <code>/stor/config/fastcache/so show</code> command to obtain a list of all storage objects currently in the FAST Cache.

Example

The following command removes Raid Group RG_1 from the FAST Cache.

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /stor/config/fastcache shrink -so rg_1
```

```
Storage system address: 10.0.0.1  
Storage system port: 443  
HTTPS connection
```

```
Operation completed successfully.
```

Delete FAST Cache

Delete the FAST Cache configuration. The storage system generates an error if FAST Cache is not configured on the system.

Format

```
/stor/config/fastcache delete [-async]
```

Action qualifier

Qualifier	Description
-async	Run the operation in asynchronous mode.

Example

The following command deletes the FAST Cache configuration:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /stor/config/fastcache delete
```

```
Storage system address: 10.0.0.1  
Storage system port: 443  
HTTPS connection  
  
Operation completed successfully.
```

Manage FAST Cache storage objects (physical deployments only)

FAST Cache storage objects include the RAID groups and drives that are in the FAST Cache.

Table 99. FAST Cache storage object attributes

Attribute	Description
ID	Identifier of the storage object.
Type	Type of storage object.
RAID level	RAID level applied to the storage object.
Drive type	Type of drive.
Number of drives	Number of drives in the storage object.
Drives	Comma-separated list of the drive IDs for each storage object.
Total space	Total space used by the storage object.
Device state	The status of the FAST Cache device. Values are: <ul style="list-style-type: none">• OK - This cache device is operating normally.• Degraded - One drive of this cache device is faulted.• Faulted - This cache device cannot operate normally.• Expanding - This cache device is expanding.• Expansion Ready - This cache device finished expanding.• Expansion Failure - This cache device failed to expand.• Shrinking - This cache device is shrinking.• Shrink Done - This cache device has flushed pages and is removed from FAST Cache.

View FAST Cache storage objects

View a list of all storage objects, including RAID groups and drives, that are in the FAST Cache.

Format

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

Object qualifier

Qualifier	Description
-id	Type the ID of the storage object in the FAST Cache.

Example 1

The following example shows FAST Cache storage objects on the system.

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

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

1:      ID              = rg_6
      Type              = RAID group
      Stripe length      = 2
      RAID level         = 1
      Number of drives   = 2
      Drive type         = SAS Flash 2
      Drives             = dae_0_1_disk_1, dae_0_1_disk_2
      Total space        = 195400433664 (181.9G)
      Device state       = OK
```

View storage profiles (physical deployments only)

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

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

For example, create a pool for file system storage resources intended for general use. When configuring a 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 file systems from an FC or iSCSI database 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.

The following table lists the attributes for storage profiles.

Table 100. Storage profile attributes

Attribute	Description
ID	ID of the storage profile.
Type	(Available only for systems that support dynamic pools) Type of pool the profile can create. Value is one of the following: <ul style="list-style-type: none">• Dynamic• Traditional
Description	Brief description of the storage profile.
Drive type	Types of drives 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">• 1 - RAID level 1.• 5 - RAID level 5.• 6 - RAID level 6.• 10 - RAID level 1+0.
Maximum capacity	Maximum storage capacity for the storage profile.
Stripe length	Number of drives the data is striped across. NOTE: For best fit profiles, this value is Best fit .
Disk group	List of drive groups recommended for the storage pool configurations of the specified storage profile. This is calculated only when the <code>-configurable</code> option is specified.

Table 100. Storage profile attributes (continued)

Attribute	Description
Maximum drives to configure	List of the maximum number of drives allowed for the specified storage profile in the recommended drive groups. This is calculated only when the <code>-configurable</code> option is specified.
Maximum capacity to configure	List of the maximum number of free capacity of the drives available to configure for the storage profile in the recommended drive groups. This is calculated only when the <code>-configurable</code> option is specified.

 **NOTE:** The `show action command` on page 21 explains how to change the output format.

Format

```
/stor/config/profile [-id <value> | -driveType <value> [-raidLevel <value>] | -traditional]
[-configurable] show
```

Object qualifier

Qualifier	Description
<code>-id</code>	Type the ID of a storage profile.
<code>-driveType</code>	Specify the type of drive.
<code>-raidLevel</code>	Specify the RAID type of the profile.
<code>-traditional</code>	(Available only for systems that support dynamic pools) Specify this option to view the profiles that you can use for creating traditional pools. To view the profiles you can use for creating dynamic pools, omit this option.
<code>-configurable</code>	<p>Show only profiles that can be configured, that is, those with non-empty drive group information. If specified, calculates the following drive group information for each profile:</p> <ul style="list-style-type: none"> • Disk group • Maximum drives to configure • Maximum capacity to configure <p>If the profile is for a dynamic pool, the calculated information indicates whether the drive group has enough drives for pool creation. The calculation assumes that the pool will be created with the drives in the specified drive group only.</p>

Example 1

The following command shows details for storage profiles that can be used to create dynamic pools:

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

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

1:  ID              = profile_22
    Type            = Dynamic
    Description     = SAS Flash 2 RAID5 (4+1)
    Drive type      = SAS Flash 2
    RAID level      = 5
    Maximum capacity = 4611148087296 (4.1T)
    Stripe length   = Maximum capacity
    Disk group      =
    Maximum drives to configure =
    Maximum capacity to configure =
```

```

2:   ID              = profile_30
    Type            = Dynamic
    Description      = SAS Flash 2 RAID10 (1+1)
    Drive type       = SAS Flash 2
    RAID level       = 10
    Maximum capacity = 9749818597376 (8.8T)
    Stripe length    = 2
    Disk group       =
    Maximum drives to configure =
    Maximum capacity to configure =

3:   ID              = profile_31
    Type            = Dynamic
    Description      = SAS Flash 2 RAID10 (2+2)
    Drive type       = SAS Flash 2
    RAID level       = 10
    Maximum capacity = 9749818597376 (8.8T)
    Stripe length    = 4
    Disk group       =
    Maximum drives to configure =
    Maximum capacity to configure =

```

Example 2

The following command shows details for storage profiles that can be used to create traditional pools in models that support dynamic pools:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /stor/config/profile -traditional -configurable show
```

```

Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

1:   ID              = tprofile_22
    Type            = Traditional
    Description      = SAS Flash 3 RAID5 (4+1)
    Drive type       = SAS Flash 3
    RAID level       = 5
    Maximum capacity = 4611148087296 (4.1T)
    Stripe length    = Maximum capacity
    Disk group       = dg_16
    Maximum drives to configure = 5
    Maximum capacity to configure = 1884243623936 (1.7T)

2:   ID              = tprofile_30
    Type            = Traditional
    Description      = SAS Flash 3 RAID10 (1+1)
    Drive type       = SAS Flash 3
    RAID level       = 10
    Maximum capacity = 9749818597376 (8.8T)
    Stripe length    = 2
    Disk group       = dg_13, dg_15
    Maximum drives to configure = 10, 10
    Maximum capacity to configure = 1247522127872 (1.1T), 2954304921600 (2.6T)

3:   ID              = tprofile_31
    Type            = Traditional
    Description      = SAS Flash 3 RAID10 (2+2)
    Drive type       = SAS Flsh 3
    RAID level       = 10
    Maximum capacity = 9749818597376 (8.8T)
    Stripe length    = 4
    Disk group       = dg_13, dg_15
    Maximum drives to configure = 8, 8
    Maximum capacity to configure = 2363443937280 (2.1T), 952103075840 (886.7G)

```

Manage drive groups (physical deployments only)

Drive groups are the groups of drives on the system with similar characteristics, including type, capacity, and spindle speed. When configuring pools, you select the drive group to use and the number of drives from the group to add to the pool.

Each drive group is identified by an ID.

The following table lists the attributes for drive groups.

Table 101. Drive group attributes

Attribute	Description
ID	ID of the drive group.
Drive type	Type of drives in the drive group.
FAST Cache	Indicates whether the drive group's drives can be added to FAST Cache.
Drive size	Capacity of one drive in the drive group.
Rotational speed	Rotational speed of the drives in the group.
Number of drives	Total number of drives in the drive group.
Unconfigured drives	Total number of drives in the drive group that are not in a pool.
Capacity	Total capacity of all drives in the drive group.
Recommended number of spares	Number of spares recommended for the drive group.
Drives past EOL	Number of drives past EOL (End of Life) in the group.
Drives approaching EOL	Number of drives that will reach EOL in 0-30 days, 0-60 days, 0-90 days and 0-180 days.

View drive groups

View details about drive groups on the system. You can filter on the drive group ID.

 **NOTE:** The `show action command` on page 21 explains how to change the output format.

Format

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

Object qualifier

Qualifier	Description
-id	Type the ID of a drive group.
-traditional	(Available only for systems that support dynamic pools) Specify this qualifier to have the system assume that the pools to be created are traditional pools.

Example 1

The following command shows details about all drive groups that can be used to configure dynamic pools:

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

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

1:      ID                      = dg_3
      Drive type                = SAS Flash 2
      FAST Cache                = yes
      Drive size                 = 393846128640 (366.7G)
      Vendor size                = 400.0G
      Rotational speed           = 0 rpm
      Number of drives           = 3
      Unconfigured drives        = 3
      Capacity                   = 1181538385920 (1.1T)
      Recommended number of spares = 0
      Drives past EOL            = 0
      Drives approaching EOL     = 0 (0-30 days), 0 (0-60 days), 0 (0-90 days), 0
(0-180 days)

2:      ID                      = dg_2
      Drive type                = SAS Flash 2
      FAST Cache                = yes
      Drive size                 = 196971960832 (183.4G)
      Vendor size                = 200.0G
      Rotational speed           = 0 rpm
      Number of drives           = 7
      Unconfigured drives        = 7
      Capacity                   = 1378803725824 (1.2T)
      Recommended number of spares = 0
      Drives past EOL            = 0
      Drives approaching EOL     = 1 (0-30 days), 2 (0-60 days), 2 (0-90 days), 3
(0-180 days)
```

Example 2

The following command shows details about all drive groups that can be used to configure traditional pools in models that support dynamic pools:

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

```
[Response]
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

[Response]
Storage system address: 10.244.223.141
Storage system port: 443
HTTPS connection

1:      ID                      = dg_8
      Drive type                = NL-SAS
      FAST Cache                = no
      Drive size                 = 1969623564288 (1.7T)
      Vendor size                = 2.0T
      Rotational speed           = 7200 rpm
      Number of drives           = 7
      Unconfigured drives        = 7
      Capacity                   = 13787364950016 (12.5T)
      Recommended number of spares = 1

2:      ID                      = dg_15
      Drive type                = SAS
      FAST Cache                = no
      Drive size                 = 590894538752 (550.3G)
      Vendor size                = 600.0G
      Rotational speed           = 15000 rpm
      Number of drives           = 16
      Unconfigured drives        = 4
```



```
Capacity = 9454312620032 (8.5T)
Recommended number of spares = 1
```

View recommended drive group configurations

View the recommended drive groups from which to add drives to a pool based on a specified storage profile or pool type.

 **NOTE:** The `show action command` on page 21 explains how to change the output format.

Format

```
/stor/config/dg recom {-profile <value>| -pool <value> | -poolName <value>}
```

Action qualifier

Qualifier	Description
-profile	Type the ID of a storage profile. The output will include the list of drive groups recommended for the specified storage profile.
-pool	Type the ID of a pool. The output will include the list of drive groups recommended for the specified pool.
-poolName	Type the name of a pool. The output will include the list of drive groups recommended for the specified pool.

Example

The following command shows the recommended drive groups for pool pool_1:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /stor/config/dg recom -pool pool_1
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

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)
```

Manage storage system capacity settings

The following table lists the general storage system capacity attributes:

Table 102. General storage system capacity attributes

Attributes	Description
Free space	Specifies the amount of space that is free (available to be used) in all storage pools on the storage system.

Table 102. General storage system capacity attributes (continued)

Attributes	Description
Used space	Specifies the amount of space that is used in all storage pools on the storage system.
Preallocated space	Space reserved across all of the pools on the storage system. This space is reserved for future needs of storage resources, which can make writes more efficient. Each pool may be able to reclaim preallocated space from storage resources if the storage resources are not using the space, and the pool space is running low.
Total space	Specifies the total amount of space, both free and used, in all storage pools on the storage system.
Data Reduction space saved	Specifies the storage size saved on the entire system when using data reduction. NOTE: Data reduction is available for thin LUNs and thin file systems in an All-Flash pool only. The thin file systems must be created on Unity systems running version 4.2.x or later.
Data Reduction percent	Specifies the storage percentage saved on the entire system when using data reduction. NOTE: Data reduction is available for thin LUNs and thin file systems in an All-Flash pool only. The thin file systems must be created on Unity systems running version 4.2.x or later.
Data Reduction ratio	Specifies the ratio between data without data reduction and data after data reduction savings. NOTE: Data reduction is available for thin LUNs and thin file systems in an All-Flash pool only. The thin file systems must be created on Unity systems running version 4.2.x or later.

View system capacity settings

View the current storage system capacity settings.

Format

```
/stor/general/system show
```

Example

The following command displays details about the storage capacity on the system:

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

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

1:      Free space                = 4947802324992 (1.5T)
        Used space                = 4947802324992 (1.5T)
        Total space              = 9895604649984 (3.0T)
        Preallocated space       = 60505210880 (56.3G)
        Compression space saved  = 4947802324992 (1.5T)
        Compression percent      = 50%
        Compression ratio        = 1
        Data Reduction space saved = 4947802324992 (1.5T)
        Data Reduction percent    = 50%
        Data Reduction ratio      = 1
```

Manage system tier capacity settings

The following table lists the general system tier capacity attributes:

Table 103. General system tier capacity attributes

Attributes	Description
Name	Name of the tier. One of the following: <ul style="list-style-type: none">• Extreme Performance• Performance• Capacity
Free space	Specifies the amount of space that is free (available to be used) in the tier.
Used space	Specifies the amount of space that is used in the tier.
Total space	Specifies the total amount of space, both free and used, in the tier.

View system tier capacity

View the current system tier capacity settings.

Format

```
/stor/general/tier show
```

Example

The following command displays details about the storage tier capacity on the system:

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

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

1:      Name      = Extreme Performance Tier
      Free space = 4947802324992 (1.5T)
      Used space = 4947802324992 (1.5T)
      Total space = 9895604649984 (3.0T)

2:      Name      = Capacity Tier
      Free space = 4947802324992 (1.5T)
      Used space = 4947802324992 (1.5T)
      Total space = 9895604649984 (3.0T)
```

Manage file systems

File systems are logical containers on the system that provide file-based storage resources to hosts. You configure file systems on NAS servers, which maintain and manage the file systems. You create network shares on the file system, which connected hosts map or mount to access the file system storage. When creating a file system, you can enable support for the following network shares:

- SMB shares (previously named CIFS shares), which provide storage access to Windows hosts.
- Network file system (NFS) shares, which provide storage access to Linux/UNIX hosts.

An ID identifies each file system.

The following table lists the attributes for file systems:

Table 104. File system attributes

Attribute	Description
ID	ID of the file system.
Name	Name of the file system.
Description	Description of the file system.
Health state	<p>Health state of the file system. The health state code appears in parentheses. Value is one of the following:</p> <ul style="list-style-type: none"> OK (5) —File system is operating normally. OK_BUT (7) —File system is working, but one or more of the following may have occurred: <ul style="list-style-type: none"> The storage resource is being initialized or deleted. The file system on this storage resource is running out of space. Allocate more storage space to the storage resource. Degraded/Warning (10) —Working, but one or more of the following may have occurred: <ul style="list-style-type: none"> One or more of its storage pools are degraded. A replication session for the storage resource is degraded. It has almost reached full capacity. Increase the primary storage size, or create additional file systems to store the data, to avoid data loss. Change file system settings on page 334 explains how to change the primary storage size. Minor failure (15) —One or both of the following may have occurred: <ul style="list-style-type: none"> One or more of its storage pools have failed. The associated NAS server has failed. Major failure (20) —One or both of the following may have occurred: <ul style="list-style-type: none"> One or more of its storage pools have failed. File system is unavailable. Critical failure (25) —One or more of the following may have occurred: <ul style="list-style-type: none"> One or more of its storage pools are unavailable. File system is unavailable. File system has reached full capacity. Increase the primary storage size, or create additional file systems to store the data, to avoid data loss. Change file system settings on page 334 explains how to change the primary storage size. Non-recoverable error (30) —One or both of the following may have occurred: <ul style="list-style-type: none"> One or more of its storage pools are unavailable. File system is unavailable.
Health details	Additional health information. See Appendix A, Reference, for health information details.
File system	Identifier for the file system. Output of some metrics commands displays only the file system ID. This enables you to easily identify the file system in the output.
Server	Name of the NAS server that the file system is mounted on.
Storage pool ID	ID of the storage pool the file system is using.
Storage pool	Name of the storage pool that the file system uses.
Format	Format of the file system. Value is UFS64.
Protocol	<p>Protocol used to enable network shares from the file system. Value is one of the following:</p> <ul style="list-style-type: none"> nfs—Protocol for Linux/UNIX hosts. cifs—Protocol for Windows hosts. multiprotocol—Protocol for UNIX and Windows hosts.
Access policy	<p>(Applies to multiprotocol file systems only.) File system access policy option. Value is one of the following:</p> <ul style="list-style-type: none"> native (default)—When this policy is selected, UNIX mode bits are used for UNIX/Linux clients, and Windows permissions (ACLs) are used for Windows clients.

Table 104. File system attributes (continued)

Attribute	Description
	<ul style="list-style-type: none"> • UNIX—When this policy is selected, UNIX mode bits are used to grant access to each file on the file system. • Windows—When this policy is selected, permissions that are defined in Windows ACLs are honored for both Windows and UNIX/Linux clients (UNIX mode bits are ignored).
Folder rename policy	<p>(Applies to multiprotocol file systems only.) File system folder rename policy option. This policy controls the circumstances under which NFS and SMB clients can rename a directory. Value is one of the following:</p> <ul style="list-style-type: none"> • forbiddenSmb (default)—Only NFS clients can rename directories without any restrictions. An SMB client cannot rename a directory if at least one file is opened in the directory or in one of its subdirectories. • allowedAll —All NFS and SMB clients can rename directories without any restrictions. • forbiddenAll—NFS and SMB clients cannot rename a directory if at least one file is opened in the directory or in one of its subdirectories.
Locking policy	<p>(Applies to multiprotocol file systems only.) File system locking policy option. This policy controls whether NFSv4 range locks must be honored. Value is one of the following:</p> <ul style="list-style-type: none"> • mandatory (default)—Uses the SMB and NFSv4 protocols to manage range locks for a file that is in use by another user. A mandatory locking policy prevents data corruption if there is concurrent access to the same locked data. • advisory —In response to lock requests, reports that there is a range lock conflict, but does not prevent the access to the file. This policy allows NFSv2 and NFSv3 applications that are not range-lock-compliant to continue working, but risks data corruption if there are concurrent writes.
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>Identifies 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.</p> <p>NOTE: The Unisphere online help provides more details on thin provisioning.</p>
Data Reduction enabled	<p>Identifies whether data reduction is enabled for this file system. Valid values are:</p> <ul style="list-style-type: none"> • yes • no (default) <p>NOTE: Data reduction is available for thin file systems in an All-Flash pool only. The thin file systems must be created on Unity systems running version 4.2.x or later.</p>
Data Reduction space saved	<p>Total space saved (in gigabytes) for this file system by using data reduction.</p> <p>NOTE: Data reduction is available for thin file systems in an All-Flash pool only. The thin file systems must be created on Unity systems running version 4.2.x or later.</p>
Data Reduction percent	<p>Total file system storage percentage saved for the file system by using data reduction.</p> <p>NOTE: Data reduction is available for thin file systems in an All-Flash pool only. The thin file systems must be created on Unity systems running version 4.2.x or later.</p>
Data Reduction ratio	<p>Ratio between data without data reduction and data after data reduction savings.</p> <p>NOTE: Data reduction is available for thin file systems in an All-Flash pool only. The thin file systems must be created on Unity systems running version 4.2.x or later.</p>

Table 104. File system attributes (continued)

Attribute	Description
Advanced deduplication enabled	<p>Identifies whether advanced deduplication is enabled for this file system. This option is available only after data reduction has been enabled. An empty value indicates that advanced deduplication is not supported on the file system. Valid values are:</p> <ul style="list-style-type: none"> yes no (default) <p>NOTE: The thin file systems must be created on a Unity system running version 4.2.x or later. Advanced deduplication is available only on:</p> <ul style="list-style-type: none"> Dynamic or Traditional pools in Unity 380F, 480F, 680F, and 880F systems Dynamic pools in Unity All-Flash 450F, 550F, and 650F systems All-Flash pools in Unity Hybrid 380, 480, 680, and 880 systems
Current allocation	If enabled, the quantity of primary storage currently allocated through thin provisioning.
Total pool space preallocated	Space reserved from the pool for the file system for future needs to make writes more efficient. The pool may be able to reclaim some of this space if pool space is low.
Total pool space used	Total pool space used in the pool for the file system. This includes the allocated space and allocations for snaps and overhead. This does not include preallocated space.
Minimum size allocated	(Displays for file systems created on a Unity system running OE version 4.1.) Minimum quantity of primary storage allocated through thin provisioning. File shrink operations cannot decrease the file system size lower than this value.
Protection size used	Quantity of storage currently used for protection data.
Protection schedule	ID of an applied protection schedule. View protection schedules on page 90 explains how to view the IDs of schedules on the system.
Protection schedule paused	Identifies whether an applied protection schedule is currently paused. Value is yes or no.
FAST VP policy	<p>FAST VP tiering policy for the file system. This policy defines both the initial tier placement and the ongoing automated tiering of data during data relocation operations. Valid values (case-insensitive):</p> <ul style="list-style-type: none"> startHighThenAuto (default)—Sets the initial data placement to the highest-performing drives with available space, and then relocates portions of the storage resource's data based on I/O activity. auto—Sets the initial data placement to an optimum, system-determined setting, and then relocates portions of the storage resource's data based on the storage resource's performance statistics such that data is relocated among tiers according to I/O activity. highest—Sets the initial data placement and subsequent data relocation (if applicable) to the highest-performing drives with available space. lowest—Sets the initial data placement and subsequent data relocation (if applicable) to the most cost-effective drives with available space.
FAST VP distribution	<p>Percentage of the file system storage assigned to each tier. The format is:</p> <pre><tier_name>:<value>%</pre> <p>where:</p> <ul style="list-style-type: none"> <tier_name> is the name of the storage tier. <value> is the percentage of storage in that tier.
CIFS synchronous write	<p>Identifies whether SMB synchronous writes option is enabled. Value is yes or no.</p> <ul style="list-style-type: none"> The SMB synchronous writes option provides enhanced support for applications that store and access database files on Windows network shares. On most SMB filesystems read operations are synchronous and write operations are asynchronous. When you enable the SMB synchronous writes option for a Windows (SMB) file system, the system performs immediate synchronous writes for storage operations, regardless of how the SMB protocol performs write operations.

Table 104. File system attributes (continued)

Attribute	Description
	<ul style="list-style-type: none"> Enabling synchronous write operations allows you to store and access database files (for example, MySQL) on SMB 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>NOTE: Do not enable SMB synchronous writes unless you intend to use the Windows file systems to provide storage for database applications.</p> <p>The Unisphere online help provides more details on SMB synchronous write.</p>
CIFS oplocks	<p>Identifies whether opportunistic file locks (oplocks) for SMB network shares are enabled. Value is <code>yes</code> or <code>no</code>.</p> <ul style="list-style-type: none"> Oplocks allow SMB clients to buffer file data locally before sending it to a server. SMB 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. This feature is enabled by default for Windows (SMB) file systems. Unless your application handles critical data or has specific requirements that make this mode or operation unfeasible, leave oplocks enabled. <p>The Unisphere online help provides more details on CIFS oplocks.</p>
CIFS notify on write	<p>Identifies whether write notifications for SMB network shares are enabled. Value is <code>yes</code> or <code>no</code>. When enabled, Windows applications receive notifications each time a user writes or changes a file on the SMB share.</p> <p>NOTE: If this option is enabled, the value for SMB directory depth indicates the lowest directory level to which the notification setting applies.</p>
CIFS notify on access	<p>Identifies whether file access notifications for SMB shares are enabled. Value is <code>yes</code> or <code>no</code>. When enabled, Windows applications receive notifications each time a user accesses a file on the SMB share.</p> <p>NOTE: If this option is enabled, the value for SMB directory depth indicates the lowest directory level to which the notification setting applies.</p>
CIFS directory depth	<p>For write and access notifications on SMB network shares, the subdirectory depth permitted for file notifications. Value range is 1-512. Default is 512.</p>
Replication type	<p>Identifies what type of asynchronous replication this file system is participating in. Valid values are:</p> <ul style="list-style-type: none"> <code>none</code> <code>local</code> <code>remote</code>
Synchronous replication type	<p>Identifies what type of synchronous replication this file system is participating in. Valid values are:</p> <ul style="list-style-type: none"> <code>none</code> <code>remote</code>
Replication destination	<p>Identifies whether the storage resource is a destination for a replication session (local or remote). Valid values are:</p> <ul style="list-style-type: none"> <code>yes</code> <code>no</code>
Migration destination	<p>Identifies whether the storage resource is a destination for a NAS import session. Valid values are:</p> <ul style="list-style-type: none"> <code>yes</code> <code>no</code>
Creation time	<p>Date and time when the file system was created.</p>
Last modified time	<p>Date and time when the file system settings were last changed.</p>
Snapshot count	<p>Number of snapshots created on the file system.</p>

Table 104. File system attributes (continued)

Attribute	Description
Pool full policy	<p>Policy to follow when the pool is full and a write to the file system is attempted. This attribute enables you to preserve snapshots on the file system when a pool is full. Valid values are:</p> <ul style="list-style-type: none"> • <code>Delete All Snaps</code> (default for thick file systems)—Delete snapshots associated with the file system when the pool reaches full capacity. • <code>Fail Writes</code> (default for thin file systems)—Fail write operations to the file system when the pool reaches full capacity. <p>NOTE: This attribute is only available for existing file systems. You cannot specify this attribute when creating a file system.</p>
Event publishing protocols	<p>List of file system access protocols enabled for Events Publishing. By default, the list is empty. Valid values are:</p> <ul style="list-style-type: none"> • <code>nfs</code>—Enable Events Publishing for NFS. • <code>cifs</code>—Enable Events Publishing for SMB (CIFS).
FLR mode	<p>Specifies which version of File-level Retention (FLR) is enabled. Values are:</p> <ul style="list-style-type: none"> • <code>enterprise</code> • <code>compliance</code> • <code>disabled</code>
FLR has protected files	<p>Indicates whether the file system contains protected files. Values are:</p> <ul style="list-style-type: none"> • <code>yes</code> • <code>no</code>
FLR clock time	<p>Indicates file system clock time to track the retention date. For example, 2019-02-20 12:55:32.</p>
FLR max retention date	<p>Maximum date and time that has been set on any locked file in an FLR-enabled file system. 2020-09-20 11:00:00</p>
FLR min retention period	<p>Indicates the shortest retention period for which files on an FLR-enabled file system can be locked and protected from deletion. The format is (<code><integer> d m y</code>) <code>infinite</code>. Values are:</p> <ul style="list-style-type: none"> • <code>d: days</code> • <code>m: months</code> • <code>y: years</code> (default is 1 day 1d) • <code>infinite</code> <p>Any non-infinite values plus the current date must be less than the maximum retention period of 2106-Feb-07.</p>
FLR default retention period	<p>Indicates the default retention period that is used in an FLR-enabled file system when a file is locked and a retention period is not specified at the file level.</p> <p>The format is (<code><integer> d m y</code>) <code>infinite</code>. Values are:</p> <ul style="list-style-type: none"> • <code>d: days</code> • <code>m: months</code> • <code>y: years</code> (FLR-C compliance default is 1 year--1y) • <code>infinite</code> (FLR-E enterprise default) <p>Any non-infinite values plus the current date must be less than the maximum retention period of 2106-Feb-07.</p>
FLR max retention period	<p>Indicates the longest retention period for which files on an FLR-enabled file system can be locked and protected from deletion. Values are:</p> <ul style="list-style-type: none"> • <code>d: days</code> • <code>m: months</code> • <code>y: years</code> • <code>infinite</code> (default)

Table 104. File system attributes (continued)

Attribute	Description
	The value should be greater than 1 day. Any non-infinite values plus the current date must be less than the maximum retention period of 2106-Feb-07.
FLR auto lock enabled	Indicates whether automatic file locking for all files in an FLR-enabled file system is enable. Values are: <ul style="list-style-type: none"> • yes • no
FLR auto delete enabled	Indicates whether automatic deletion of locked files from an FLR-enabled file system once the retention period has expired is enabled. Values are: <ul style="list-style-type: none"> • yes • no <p>i NOTE: The system scans for expired files every seven days and deletes them automatically if auto-delete is enabled. The seven day period begins the day after auto-delete is enabled on the file system.</p>
FLR policy interval	When Auto-lock new files is enabled, this indicates a time interval for how long to wait after files are modified before the files are automatically locked in an FLR-enabled file system. <p>The format is <value><qualifier>, where value is an integer and the qualifier is:</p> <ul style="list-style-type: none"> • m--minutes • h--hours • d--days <p>The value should be greater than 1 minute and less than 366 days.</p>
Error Threshold	Specifies the threshold of used space in the file system as a percentage. When exceeded, error alert messages will be generated. The default value is 95%. If the threshold value is set to 0, this alert is disabled. This option must be set to a value greater than the Warning Threshold and Info Threshold.
Warning Threshold	Specifies the threshold of used space in the file system as a percentage. When exceeded, warning alert messages will be generated. The default value is 75%. If the threshold value is set to 0, this alert is disabled. This option must be set to a value less than the Error Threshold value, and greater than or equal to the Info Threshold value.
Info Threshold	Specifies the threshold of used space in the file system as a percentage. When exceeded, informational alert messages will be generated. The default value is 0 (disabled). This option must be set to a value less than the Warning Threshold value.

Create file systems

Create a multiprotocol file system, NFS file system, or CIFS (SMB) file system. You must create a file system for each type of share (NFS or CIFS) you plan to create. Once you create a file system, create the NFS or CIFS network shares and use the ID of the file system to associate it with a share.

i **NOTE:** [Size qualifiers](#) on page 20 provides details on using size qualifiers to specify a storage size.

Prerequisites

- Configure at least one storage pool for the file system to use and allocate at least one drive to the pool. [Configure custom pools](#) on page 288 explains how to create custom pools.
- Configure at least one NAS server to which to associate the file system. [Create a NAS server](#) on page 106 explains how to configure NAS servers.

Format

```
/stor/prov/fs create [-async] -name <value> [-descr <value>] {-server <value> | -serverName <value>} {-pool <value> | -poolName <value>} -size <value> [-thin {yes | no}] [-dataReduction {yes [-advancedDedup {yes | no}] | no}] [-minSizeAllocated <value>] -type {{nfs | cifs | multiprotocol [-accessPolicy {native | Windows | Unix}] [-folderRenamePolicy {allowedAll | forbiddenSmb | forbiddenAll}] [-lockingPolicy {advisory | mandatory}]} [-cifsSyncWrites {yes | no}] [-cifsOpLocks {yes | no}] [-cifsNotifyOnWrite {yes | no}] [-cifsNotifyOnAccess {yes | no}] [-cifsNotifyDirDepth <value>] | nfs} [-fastvpPolicy {startHighThenAuto | auto | highest | lowest}] [-sched <value> [-schedPaused {yes | no}]] [-replDest {yes | no}][-eventProtocols <value>] [-flr {disabled | {enterprise | compliance}} [-flrMinRet <value>] [-flrDefRet <value>] [-flrMaxRet <value>]]}
```

Action qualifiers

Qualifier	Description
-async	Run the operation in asynchronous mode.
-name	Type a name for the file system.
-descr	Type a brief description of the file system.
-server	Type the ID of the NAS server that will be the parent NAS server for the file system. View NAS servers on page 108 explains how to view the IDs of the NAS servers on the system.
-serverName	Type the name of the NAS server that will be the parent NAS server for the file system.
-pool	Type the ID of the pool to be used for the file system.
-poolName	Type the name of the pool to be used for the file system. This value is case insensitive. View pools on page 296 explains how to view the names of the storage pools on the system.
-size	Type the quantity of storage to reserve for the file system.
-thin	Enable thin provisioning on the file system. Valid values are: <ul style="list-style-type: none"> yes (default) no
-dataReduction	Specify whether data reduction is enabled for the thin file system. Valid values are: <ul style="list-style-type: none"> yes (default) no <i>i</i> NOTE: Data reduction is available for thin file systems in an All-Flash pool only. The thin file systems must be created on Unity systems running version 4.2.x or later.
-advancedDedup	Specify whether advanced deduplication is enabled for the thin file system. This option is available only after data reduction has been enabled. Valid values are: <ul style="list-style-type: none"> yes no (default) <i>i</i> NOTE: The thin file systems must be created on a Unity system running version 4.2.x or later. Advanced deduplication is available only on: <ul style="list-style-type: none"> Dynamic or Traditional pools in Unity 380F, 480F, 680F, and 880F systems Dynamic pools in Unity All-Flash 450F, 550F, and 650F systems All-Flash pools in Unity Hybrid 380, 480, 680, and 880 systems
-minSizeAllocated	(Option available on a Unity system running OE version 4.1.) Specify the minimum size to allocate for the thin file system. Automatic and manual file shrink operations cannot decrease the file system size lower than this value. The default value is 3G, which is the minimum thin file system size.
-type	Specify the type of network shares to export from the file system. Valid values are: <ul style="list-style-type: none"> nfs — Network shares for Linux/UNIX hosts.

Qualifier	Description
	<ul style="list-style-type: none"> • <code>cifs</code> — Network shares for Windows hosts. • <code>multiprotocol</code> — Network shares for multiprotocol sharing.
<code>-accessPolicy</code>	(Applies to multiprotocol file systems only.) Specify the access policy for this file system. Valid values are: <ul style="list-style-type: none"> • <code>native</code> (default) • <code>unix</code> • <code>windows</code>
<code>-folderRenamePolicy</code>	(Applies to multiprotocol file systems only.) Specify the rename policy for the file system. Valid values are: <ul style="list-style-type: none"> • <code>forbiddenSMB</code> (default) • <code>allowedAll</code> • <code>forbiddenAll</code>
<code>-lockingPolicy</code>	(Applies to multiprotocol file systems only.) Specify the locking policy for the file system. Valid values are: <ul style="list-style-type: none"> • <code>mandatory</code> (default) • <code>advisory</code>
<code>-cifsSyncWrites</code>	Enable synchronous write operations for CIFS network shares. Valid values are: <ul style="list-style-type: none"> • <code>yes</code> • <code>no</code> (default)
<code>-cifsOpLocks</code>	Enable opportunistic file locks (oplocks) for CIFS network shares. Valid values are: <ul style="list-style-type: none"> • <code>yes</code> (default) • <code>no</code>
<code>-cifsNotifyOnWrite</code>	Enable to receive notifications when users write to a CIFS share. Valid values are: <ul style="list-style-type: none"> • <code>yes</code> • <code>no</code> (default)
<code>-cifsNotifyOnAccess</code>	Enable to receive notifications when users access a CIFS share. Valid values are: <ul style="list-style-type: none"> • <code>yes</code> • <code>no</code> (default)
<code>-cifsNotifyDirDepth</code>	If the value for <code>-cifsNotifyOnWrite</code> or <code>-cifsNotifyOnAccess</code> is <code>yes</code> (enabled), specify the subdirectory depth to which the notifications will apply. Value range is within range 1–512. Default is 512.
<code>-folderRenamePolicy</code>	Specify to rename the policy type for the specified file system. Valid values are: <ul style="list-style-type: none"> • <code>allowedAll</code> • <code>forbiddenSmb</code> (default) • <code>forbiddenAll</code>
<code>-lockingPolicy</code>	Set the locking policy for this type of file system. Valid values are: <ul style="list-style-type: none"> • <code>advisory</code> • <code>mandatory</code> (default)
<code>-fastvpPolicy</code>	Specify the FAST VP tiering policy for the file system. This policy defines both the initial tier placement and the ongoing automated tiering of data during data relocation operations. Valid values (case insensitive): <ul style="list-style-type: none"> • <code>startHighThenAuto</code> (default) — Sets the initial data placement to the highest-performing drives with available space, and then relocates portions of the storage resource's data based on I/O activity. • <code>auto</code> — Sets the initial data placement to an optimum, system-determined setting, and then relocates portions of the storage resource's data based on the storage resource's performance statistics such that data is relocated among tiers according to I/O activity. • <code>highest</code> — Sets the initial data placement and subsequent data relocation (if applicable) to the highest-performing drives with available space.

Qualifier	Description
	<ul style="list-style-type: none"> lowest — Sets the initial data placement and subsequent data relocation (if applicable) to the most cost-effective drives with available space.
-sched	Type the ID of a protection schedule to apply to the storage resource. View protection schedules on page 90 explains how to view the IDs of the schedules on the system.
-schedPaused	Specify whether to pause the protection schedule specified for -sched. Valid values are: <ul style="list-style-type: none"> yes no
-replDest	Specifies whether the resource is a replication destination. Valid values are: <ul style="list-style-type: none"> yes no (default)
-eventProtocols	Specifies the comma-separated list of file system access protocols enabled for Events Publishing. By default, the list is empty. Valid values are: <ul style="list-style-type: none"> nfs — Enable Events Publishing for NFS. cifs — Enable Events Publishing for CIFS (SMB).
-flr	Specifies whether File-level Retention (FLR) is enabled and if so, which version of FLR is being used. Valid values are: <ul style="list-style-type: none"> enterprise — Specify to enable FLR-E. compliance — Specify to enable FLR-C. disabled (default) — Specify to disable FLR.
-flrMinRet	Specify the shortest retention period for which files on an FLR-enabled file system will be locked and protected from deletion. Valid values are: <ul style="list-style-type: none"> d: days (default is 1 day 1d) m: months y: years infinite
-flrDefRet	Specify the default retention period that is used in an FLR-enabled file system where a file is locked, but a retention period was not specified at the file level. The format is (<integer> d m y) infinite. <ul style="list-style-type: none"> d: days m: months y: years — FLR-C (compliance) default is 1 year--1y) infinite — FLR-E (enterprise) default Any non-infinite values plus the current date must be less than the maximum retention period of 2106-Feb-07. The value of this parameter must be greater than the minimum retention period -flrMinRet.
-flrMaxRet	Specify the maximum date and time that has been set on any locked file in an FLR-enabled file system. Values are: <ul style="list-style-type: none"> d: days m: months y: years infinite (default) The value should be greater than 1 day. Any non-infinite values plus the current date must be less than the maximum retention period of 2106-Feb-07. The value of this parameter must be greater than the default retention period -flrDefRet.

Example

The following command creates a file system with these settings:

- Name is FileSystem01.
- Description is "Multiprotocol file system".
- Uses the capacity storage pool.
- Uses NAS server nas_2 as the parent NAS server.
- Primary storage size is 3 GB.
- Supports multiprotocol network shares.
- Has a native access policy.
- Is a replication destination.

The file system receives the ID res_28:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /stor/prov/fs create -name FileSystem01 -
descr "Multiprotocol file system" -server nas_2 -pool capacity -size 3G -type multiprotocol
-accessPolicy native -replDest yes
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

ID = res_28
Operation completed successfully.
```

View file systems

View details about a file system. You can filter on the file system ID.

 **NOTE:** The `show action command` on page 21 explains how to change the output format.

Format

```
/stor/prov/fs [{-id <value> | -name <value> | -server <value> | -serverName <value>}] show
```

Object qualifiers

Qualifier	Description
-id	Type the ID of a file system.
-name	Type the name of a file system.
-server	Type the ID of the NAS server for which the file systems will be displayed.
-serverName	Type the name of the NAS server for which the file systems will be displayed.

Example

The following command lists details about all file systems on the storage system:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /stor/prov/fs show -detail
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

1:      ID              = res_1
      Name              = fs_
      Description        =
      Health state       = OK (5)
      Health details     = "The component is operating normally. No action
is required."
      File system        = fs_1
      Server             = nas_1
```


```

Storage pool ID          = pool_1
Storage pool             = pool_1
Format                   = UFS64
Protocol                 = nfs
Access policy            = unix
Folder rename policy     = forbiddenSmb
Locking policy           = mandatory
Size                     = 53687091200 (50.0G)
Size used                = 1620303872 (1.5G)
Maximum size             = 281474976710656 (256.0T)
Thin provisioning enabled = yes
Compression enabled      = no
Compression space saved  = 0
Compression percent      = 0%
Compression ratio        = 1.0:1
Data Reduction enabled   = no
Data Reduction space saved = 0
Data Reduction percent   = 0%
Data Reduction ratio     = 1.0:1
Advanced deduplication enabled = no
Current allocation       = 283140096 (270.0M)
Preallocated             = 2401214464 (2.2G)
Total Pool Space Used    = 4041236480 (3.7G)
Minimum size allocated   =
Protection size used     = 0
Snapshot count           = 0
Protection schedule      =
Protection schedule paused = no
FLR mode                 = Disabled
FLR has protected files  =
FLR clock time           =
FLR max retention date   =
FLR min retention period =
FLR default retention period =
FLR max retention period =
FLR auto lock enabled    =
FLR auto delete enabled  =
FLR policy interval      =
Error threshold          = 95%
Warning threshold        = 75%
Info threshold           = 10%
CIFS synchronous write   = no
CIFS oplocks             = no
CIFS notify on write     = no
CIFS notify on access    = no
CIFS directory depth     = 512
Replication type         = none
Synchronous replication type = none
Replication destination  = no
Migration destination    = no
FAST VP policy           = Start high then auto-tier
FAST VP distribution     =
Creation time            = 2018-12-03 10:04:10
Last modified time       = 2018-12-04 06:49:31
Pool full policy         = Fail Writes
Event publishing protocols =

```

Change file system settings

Change the settings for a file system.

 **NOTE:** [Size qualifiers](#) on page 20 explains how to use the size qualifiers when specifying a storage size.

Format

```

/stor/prov/fs {-id <value> | -name <value>} set [-async] [-descr <value>] [-accessPolicy
{native | Unix | Windows}] [-folderRenamePolicy {allowedAll | forbiddenSmb | forbiddenAll}]
[-lockingPolicy {advisory | mandatory}] [-size <value>] [-minSizeAllocated <value>] [-



```

```
dataReduction {yes [-advancedDedup {yes | no}} | no}} [-cifsSyncWrites {yes | no}} [-fastvpPolicy {startHighThenAuto | auto | highest | lowest | none}} [-cifsOpLocks {yes | no}} [-cifsNotifyOnWrite {yes | no}} [-cifsNotifyOnAccess {yes | no}} [-cifsNotifyDirDepth <value>] [{-sched <value> | -noSched}} [-schedPaused {yes | no}} [-replDest {yes | no}} [-poolFullPolicy {deleteAllSnaps | failWrites}} [-eventProtocols <value>] [-flr [-flrMinRet <value>] [-flrDefRet <value>] [-flrMaxRet <value>] [-flrAutoLock {yes | no}} [-flrAutoDelete {yes | no}} [-flrPolicyInterval <value>]] [-errorThreshold <value>] [-warningThreshold <value>] [-infoThreshold <value>]
```

Object qualifiers

Qualifier	Description
-id	Type the ID of the file system to change.
-name	Type the name of the file system to change.

Action qualifiers

Qualifier	Description
-async	Run the operation in asynchronous mode.
-descr	Type a brief description of the file system.
-accessPolicy	(Applies to multiprotocol file systems only.) Specify the access policy for the file system. Valid values are: <ul style="list-style-type: none"> • native • unix • windows
-folderRenamePolicy	(Applies to multiprotocol file systems only.) Specify the rename policy for the file system. Valid values are: <ul style="list-style-type: none"> • forbiddenSMB (default) • allowedAll • forbiddenAll
-lockingPolicy	(Applies to multiprotocol file systems only.) Specify the locking policy for the file system. Valid values are: <ul style="list-style-type: none"> • mandatory (default) • advisory
-size	Type the amount of storage in the pool to reserve for the file system.
-minSizeAllocated	(Option available on a Unity system running OE version 4.1.) Specify the minimum size to allocate for the thin file system. Automatic and manual file shrink operations cannot decrease the file system size lower than this value. The default value is 3G, which is the minimum thin file system size.
-dataReduction	Enable data reduction on the thin file system. Valid values are: <ul style="list-style-type: none"> • yes • no <p> NOTE: Data reduction is available for thin file systems in an All-Flash pool only. The thin file systems must have been created on Unity systems running version 4.2.x or later.</p>
-advancedDedup	Enable advanced deduplication on the thin file system. This option is available only after data reduction has been enabled. Valid values are: <ul style="list-style-type: none"> • yes • no (default) <p> NOTE: The thin file systems must be created on a Unity system running version 4.2.x or later. Advanced deduplication is available only on:</p>

Qualifier	Description
	<ul style="list-style-type: none"> Dynamic or Traditional pools in Unity 380F, 480F, 680F, and 880F systems Dynamic pools in Unity All-Flash 450F, 550F, and 650F systems All-Flash pools in Unity Hybrid 380, 480, 680, and 880 systems
-cifsSyncWrites	Enable synchronous write operations for CIFS (SMB) network shares. Valid values are: <ul style="list-style-type: none"> yes no
-cifsOpLocks	Enable opportunistic file locks (oplocks) for CIFS network shares. Valid values are: <ul style="list-style-type: none"> yes no
-cifsNotifyOnWrite	Enable to receive notifications when users write to a CIFS share. Valid values are: <ul style="list-style-type: none"> yes no
-cifsNotifyOnAccess	Enable to receive notifications when users access a CIFS share. Valid values are: <ul style="list-style-type: none"> yes no
-cifsNotifyDirDepth	If the value for -cifsNotifyOnWrite or -cifsNotifyOnAccess is yes (enabled), specify the subdirectory depth to which the notifications will apply. Value range is 1–512. Default is 512.
-sched	Type the ID of the schedule to apply to the file system. View protection schedules on page 90 explains how to view the IDs of the schedules on the system.
-schedPaused	Pause the schedule specified for the -sched qualifier. Valid values are: <ul style="list-style-type: none"> yes no
-noSched	Unassigns the protection schedule.
-fastvpPolicy	Specify the FAST VP tiering policy for the file system. This policy defines both the initial tier placement and the ongoing automated tiering of data during data relocation operations. Valid values (case-insensitive): <ul style="list-style-type: none"> startHighThenAuto (default)—Sets the initial data placement to the highest-performing drives with available space, and then relocates portions of the storage resource's data based on I/O activity. auto—Sets the initial data placement to an optimum, system-determined setting, and then relocates portions of the storage resource's data based on the storage resource's performance statistics such that data is relocated among tiers according to I/O activity. highest—Sets the initial data placement and subsequent data relocation (if applicable) to the highest-performing drives with available space. lowest—Sets the initial data placement and subsequent data relocation (if applicable) to the most cost-effective drives with available space.
-replDest	Specifies whether the resource is a replication destination. Valid values are: <ul style="list-style-type: none"> yes no
-poolFullPolicy	Specifies the policy to follow when the pool is full and a write to the file system is tried. This attribute enables you to preserve snapshots on the file system when a pool is full. Valid values are: <ul style="list-style-type: none"> deleteAllSnaps—Delete snapshots that are associated with the file system when the pool reaches full capacity. failWrites—Fail write operations to the file system when the pool reaches full capacity.
-eventProtocols	Specifies a list of file system access protocols enabled for Events Publishing. By default, the list is empty. Valid values are: <ul style="list-style-type: none"> nfs—Enable Events Publishing for NFS. cifs—Enable Events Publishing for CIFS (SMB).

Qualifier	Description
<code>-flrMinRet</code>	Specify the shortest retention period for which files on an FLR-enabled file system will be locked and protected from deletion. Valid values are: <ul style="list-style-type: none"> • <code>d</code>: days (default is 1 day <code>1d</code>) • <code>m</code>: months • <code>y</code>: years • <code>infinite</code>
<code>-flrDefRet</code>	Specify the default retention period that is used in an FLR-enabled file system where a file is locked, but a retention period was not specified at the file level. The format is <code><integer> d m y infinite</code> . <ul style="list-style-type: none"> • <code>d</code>: days • <code>m</code>: months • <code>y</code>: years — FLR-C (compliance) default is 1 year--<code>1y</code>) • <code>infinite</code> — FLR-E (enterprise) default Any non-infinite values plus the current date must be less than the maximum retention period of 2106-Feb-07. The value of this parameter must be greater than the minimum retention period <code>-flrMinRet</code> .
<code>-flrMaxRet</code>	Specify the maximum date and time that has been set on any locked file in an FLR-enabled file system. Values are: <ul style="list-style-type: none"> • <code>d</code>: days • <code>m</code>: months • <code>y</code>: years • <code>infinite</code> (default) The value should be greater than 1 day. Any non-infinite values plus the current date must be less than the maximum retention period of 2106-Feb-07. The value of this parameter must be greater than the default retention period <code>-flrDefRet</code> .
<code>-flrAutoLock</code>	Specify whether automatic file locking is enabled for all new files in an FLR-enabled file system. Valid values are: <ul style="list-style-type: none"> • <code>yes</code> • <code>no</code>
<code>-flrAutoDelete</code>	Specify whether locked files in an FLR-enabled file system will automatically be deleted once the retention period expires. Valid values are: <ul style="list-style-type: none"> • <code>yes</code> • <code>no</code>
<code>-flrPolicyInterval</code>	If <code>-flrAutoLock</code> is set to <code>yes</code> , specify a time interval for how long after files are modified they will be automatically locked in an FLR-enabled file system. The format is <code><value><qualifier></code> , where value is an integer and the qualifier is: <ul style="list-style-type: none"> • <code>m--minutes</code> • <code>h--hours</code> • <code>d--days</code> The value should be greater than 1 minute and less than 366 days.
<code>-errorThreshold</code>	Specify the threshold percentage that, when exceeded, error alert messages will be generated. The range is from 0 to 99, and the default value is 95%. If the threshold value is set to 0, this alert is disabled. This option must be set to a value greater than the <code>-warningThreshold</code> .
<code>-warningThreshold</code>	Specify the threshold percentage that, when exceeded, warning alert messages will be generated. The range is from 0 to 99, and the default value is 75%. If the threshold value is set to 0, this alert is disabled. This option must be set to a value less than the <code>-errorThreshold</code> value, and greater than or equal to the <code>-infoThreshold</code> value.

Qualifier	Description
-infoThreshold	Specify the threshold percentage that, when exceeded, informational alert messages will be generated. The range is from 0 to 99, and the default value is 0 (disabled). This option must be set to a value less than the -warningThreshold value.

Example

The following command specifies Events Publishing protocols:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /stor/prov/fs -id res_1 set -eventProtocols nfs,cifs
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

ID = res_1
Operation completed successfully.
```

Delete file systems

Delete a file system.

- NOTE:** Deleting a file system removes all network shares, and optionally snapshots associated with the file system from the system. After the file system is deleted, the files and folders inside it cannot be restored from snapshots. Back up the data from a file system before deleting it from the storage system.
- NOTE:** You cannot delete an FLR-C enabled file system that has currently locked and protected files. An FLR-E file system can be deleted, even if it does contain protected files.

Format

```
/stor/prov/fs {-id <value> | -name <value>} delete [-deleteSnapshots {yes | no}] [-async]
```

Object qualifiers

Qualifier	Description
-id	Type the ID of the file system to delete.
-name	Type the name of the file system to delete.

Action qualifiers

Qualifier	Description
-deleteSnapshots	Specifies that snapshots of the file system can be deleted along with the file system itself. Valid values are: <ul style="list-style-type: none"> • yes • no (default)
-async	Run the operation in asynchronous mode.

Example

The following command deletes file system FS_1:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /stor/prov/fs -id res_1 delete
```

```
Storage system address: 10.0.0.1  
Storage system port: 443  
HTTPS connection
```



```
Operation completed successfully.
```

Manage user quotas for file systems and quota trees

A user quota limits the amount of storage consumed by an individual user storing data on a file system or quota tree.

The following table lists the attributes for user quotas:

Table 105. Attributes for user quotas

Attribute	Description
File system	Identifier for the file system that the quota will act upon. The file system cannot be read-only or a replication destination.
Path	Quota tree path relative to the root of the file system. If the user quota is on a file system, either do not use this qualifier, or set its value to /.
User ID	User identifier on the file system.
Unix name	Comma-separated list of Unix user names associated with the user quota. Multiple Unix names may appear when the file system is a multiple protocol file system and multiple Unix names map to one Windows name in the user mapping configuration file (nxtmap).
Windows SIDs	Comma-separated list of Windows SIDs associated with the user quota.  NOTE: The number of displayed SIDs is limited to 16. If the number of SIDs is over 16, only first 16 are displayed.
Windows name	Comma-separated list of Windows user names associated with the user quota. Multiple Windows names may appear when the file system is a multiple protocol file system and multiple Windows names map to one Unix name in the user mapping configuration file (nxtmap).  NOTE: If the number of Windows names is over 16, only the first 16 Windows names are displayed.
Space used	Spaced used on the file system or quota tree by the specified user.
Soft limit	Preferred limit on storage usage. The system issues a warning when the soft limit is reached.
Hard limit	Absolute limit on storage usage. If the hard limit is reached for a user quota on a file system or quota tree, the user will not be able to write data to the file system or tree until more space becomes available.
Grace period left	Time period for which the system counts down days once the soft limit is met. If the user's grace period expires, users cannot write to the file system or quota tree until more space becomes available, even if the hard limit has not been reached.
State	State of the user quota. Valid values are: <ul style="list-style-type: none">• OK• Soft limit exceeded• Soft limit exceeded and grace period expired• Hard limit exceeded

Create a user quota on a file system or quota tree


You can create user quotas on a file system or quota tree:

- Create a user quota on a file system to limit or track the amount of storage space that an individual user consumes on that file system. When you create or modify a user quota on a file system, you have the option to use default hard and soft limits that are set at the file-system level.
- Create a user quota on a quota tree to limit or track the amount of storage space that an individual user consumes on that tree. When you create a user quota on a quota tree, you have the option to use the default hard and soft limits that are set at the quota-tree level.

Format

```
/quota/user create [-async] {-fs <value> | -fsName <value>} [-path <value>] {-userId <value> | -unixName <value> | -winName <value>} {-default | [-softLimit <value>] [-hardLimit <value>]}
```

Action qualifiers

Qualifier	Description
-async	Run the operation in asynchronous mode.
-fs	Specify the ID of the file system that the quota will act upon. The file system cannot be read-only or a replication destination.
-fsName	Specify the name of the file system that the quota will act upon. The file system cannot be read-only or a replication destination.
-path	Specify either of the following: <ul style="list-style-type: none"> • If the user quota is for a file system, either do not use this qualifier, or set its value to /. • If the user quota is for a quota tree, specify the quota tree path relative to the root of the file system.
-userId	Specify the user ID on the file system or quota tree.
-unixName	Specify the UNIX user name associated with the specified user ID.
-winName	Specify the Windows user name associated with the specified user ID. The format is: [<domain>\]<name>
-default	Inherit the default quota limit settings for the user. To view the default limits, use the following command: <code>/quota/config -fs <value> -path <value> show</code> If a soft limit or hard limit has not been specified for the user, the default limit is applied.
-softLimit	Specify the preferred limit on storage usage by the user. A value of 0 means no limitation. If the hard limit is specified and the soft limit is not specified, there will be no soft limitation.
-hardLimit	Specify the absolute limit on storage usage by the user. A value of 0 means no limitation. If the soft limit is specified and the hard limit is not specified, there will be no hard limitation.  NOTE: The hard limit should be larger than the soft limit.

Example

The following command creates a user quota for user 201 on file system res_1, quota tree /qtree_1. The new user quota has the following limits:

- Soft limit is 20 GB.
- Hard limit is 50 GB.

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /quota/user create -fs res_1 -path /qtree_1 -userId 201 -softLimit 20G -hardLimit 50G
```


```
Storage system address: 10.64.75.201
Storage system port: 443
HTTPS connection
```

Operation completed successfully.

View user quotas

You can display space usage and limit information for user quotas on a file system or quota tree.

Because there can be a large amount of user quotas on a file system or quota tree, to reduce the impact on system performance, the system only updates user quota data every 24 hours. You can use the refresh action to update the data more often. Use the `/quota/config show` command to see the time spent for the data refresh.

 **NOTE:** The Unix name and Windows name values are returned only when displaying a single user quota.

 **NOTE:** The `show` action command on page 21 explains how to change the output format.

Format

```
/quota/user {-fs <value> | -fsName <value>} [-path <value>] [-userId <value> | -unixName <value> | -winName <value>] [-exceeded] show
```

Object qualifiers

Qualifier	Description
-fs	Specify the ID of the file system.
-fsName	Specify the name of the file system.
-path	Specify either of the following: <ul style="list-style-type: none">• If the user quota is for a file system, either do not use this qualifier, or set its value to <code>/</code>.• If the user quota is for a quota tree, specify the quota tree path relative to the root of the file system.
-userId	Specify the user ID on the file system or quota tree.
-unixName	Specify the Unix user name.
-winName	Specify the Windows user name. The format is: [<domain>\]<name>
-exceeded	Only show user quotas whose state is not OK.

Example

The following command displays space usage information for user nasadmin on file system res_1, quota tree /qtree_1:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /quota/user -fs res_1 -path /qtree_1  
unixName nasadmin show -detail
```

```
Storage system address: 10.0.0.1  
Storage system port: 443  
HTTPS connection  
  
1:      User ID           = 201  
        Unix name        = nasadmin  
        Windows names     = dell\nasadmin, dell\nasad  
        Windows SIDs      = S-1-5-32-544, S-1-5-32-545  
        Space used        = 32768 (32K)  
        Soft limit        = 16384 (16K)  
        Hard limit        = 65536 (64K)  
        Grace period left = 7d 3h  
        State             = Soft limit exceeded
```

Change quota limits for a specific user

You can change limits for user quotas on a file system or quota tree.


Format

```
/quota/user {-fs | -fsName <value>} [-path <value>] {-userId <value> | -unixName <value> | winName <value>} set [-async] {-default | [-softLimit <value>] [-hardLimit <value>]}
```

Object qualifiers

Qualifier	Description
-fs	Specify the ID of the file system.
-fsName	Specify the name of the file system.
-path	Specify either of the following: <ul style="list-style-type: none">• If the user quota is for a file system, either do not use this qualifier, or set its value to /.• If the user quota is for a quota tree, specify the quota tree path relative to the root of the file system.
-userId	Specify the user ID on the file system or quota tree.
-unixName	Specify the UNIX user name associated with the specified user ID.
-winName	Specify the Windows user name associated with the specified user ID. The format is: [<domain>\]<name>

Action qualifiers

Qualifier	Description
-async	Run the operation in asynchronous mode.
-default	Inherit the default quota limit settings for the user. To view the default limit, use the command: <code>config -fs <value> -path <value> show</code> If a soft or hard limit has not been specified for the user, the default limit is applied.
-softLimit	Specify the preferred limit on storage usage by the user. A value of 0 means no limitation. If the hard limit is specified and the soft limit is not specified, there will be no soft limitation.
-hardLimit	Specify the absolute limit on storage usage by the user. A value of 0 means no limitation. If the soft limit is specified and the hard limit is not specified, there will be no hard limitation.  NOTE: The hard limit should be larger than the soft limit.

Example

The following command makes the following changes to the user quota for user 201 on file system res_1, quota tree path /qtree_1:

- Sets the soft limit to 10 GB.
- Sets the hard limit to 20 GB.

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /quota/user -fs res_1 -path /qtree_1 -userId 201 set -softLimit 10G -hardLimit 20G
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection
```

Operation completed successfully.


Refresh user quotas

Because there can be a large amount of user quotas on a file system or quota tree, to reduce the impact on system performance, the system only updates user quota data every 24 hours. Use the refresh action to update the data more often. Use the `/quota/config show` command to view the time spent for the data refresh.

Format

```
/quota/user {-fs <value> | -fsName <value>} [-path <value>] refresh [-updateNames] [-async]
```

Object qualifiers

Qualifier	Description
-fs	Specify the ID of the file system.
-fsName	Specify the name of the file system.
-path	Specify either of the following: <ul style="list-style-type: none">• If the user quota is on a file system, either do not use this qualifier, or set its value to <code>/</code>.• If the user quota is on a quota tree, specify the quota tree path relative to the root of the file system.
-updateNames	Refresh the usage data of user quotas and the Windows user names, Windows SIDs, and Unix user names within a file system or quota tree.  NOTE: Refreshing user names causes latency because the system needs to query the name servers, so use this qualifier sparingly. The system automatically updates Windows user names, Windows SIDs, and Unix user names for user quotas every 24 hours.

Action qualifier

Qualifier	Description
-async	Run the operation in asynchronous mode.

Example

The following command refreshes all user quotas on file system `res_1`, quota tree `tree_1`:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /quota/user -fs res_1 -path /tree_1 refresh
```

```
[Response]
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

Operation completed successfully.
```

Manage quota trees

A quota tree is a directory that has a quota applied to it, which limits or tracks the total storage space consumed that directory. The hard limit, soft limit, and grace period settings you define for a quota tree are used as defaults for the quota tree's user

quotas. You can override the hard and soft limit settings by explicitly specifying these settings when you create or modify a user quota.

The following table lists the attributes for quota trees:

Table 106. Attributes for quota trees

Attribute	Description
File system	Identifier for the file system.
Path	Quota tree path relative to the root of the file system.
Description	Quota tree description.
Soft limit	Preferred limit on storage usage. The system issues a warning when the soft limit is reached.
Hard limit	Absolute limit on storage usage. If the hard limit is reached for a quota tree, users will not be able to write data to tree until more space becomes available.
Grace period left	Period that counts down time once the soft limit is met. If the quota tree's grace period expires, users cannot write to the quota tree until more space becomes available, even if the hard limit has not been reached.
State	State of the user quota. Valid values are: <ul style="list-style-type: none">• OK• Soft limit exceeded• Soft limit exceeded and grace period expired• Hard limit exceeded

Create a quota tree

Create a quota tree to track or limit the amount of storage consumed on a directory. You can use quota trees to:


- Set storage limits on a project basis. For example, you can establish quota trees for a project directory that has multiple users sharing and creating files in it.
- Track directory usage by setting the quota tree's hard and soft limits to 0 (zero).

Format

```
/quota/tree create [-async] { -fs <value> | -fsName <value>} -path <value> [-descr <value>]  
{-default | [-softLimit <value>] [-hardLimit <value>]}
```

Action qualifiers

Qualifier	Description
-async	Run the operation in asynchronous mode.
-fs	Specify the ID of the file system in which the quota tree will reside. The file system cannot be read-only or a replication destination.
-fsName	Specify the name of the file system in which the quota tree will reside. The file system cannot be read-only or a replication destination
-path	Specify the quota tree path relative to the root of the file system.
-descr	Specify the quota tree description.
-default	Specify to inherit the default quota limit settings for the tree. Use the View quota trees on page 345 command to view these default limits.

Qualifier	Description
-softLimit	Specify the preferred limit for storage space consumed on the quota tree. A value of 0 means no limitation. If the hard limit is specified and soft limit is not specified, there will be no soft limitation.
-hardLimit	Specify the absolute limit for storage space consumed on the quota tree. A value of 0 means no limitation. If the soft limit is specified and the hard limit is not specified, there will be no hard limitation.  NOTE: The hard limit should be larger than the soft limit.

Example

The following command creates quota tree /qtree_1 on file system res_1. The new quota tree has the following characteristics:

- Soft limit is 100 GB.
- Hard limit is 200 GB.

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /quota/tree create -fs res_1 -path /
qtree_1 -softLimit 100G -hardLimit 200G
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection
```

```
Operation completed successfully.
```

View quota trees

You can display space usage and limit information for all quota trees on a file system or a single quota tree.

Because there can be a large amount of quota trees on a file system, to reduce the impact on system performance, the system only updates quota data every 24 hours. You can use the refresh action to update the data more often. Use the /quota/config show command to view the time spent for the data refresh.

 **NOTE:** The [show action command](#) on page 21 explains how to change the output format.

Format

```
/quota/tree {-fs <value> | -fsName <value>} [-path <value>] [-exceeded] show
```

Object qualifiers

Qualifier	Description
-fs	Specify the ID of the file system.
-fsName	Specify the name of the file system.
-path	Specify the quota tree path, which is relative to the root of the file system.
-exceeded	Only show quota trees whose state is not OK.

Example

The following command displays space usage information for all quota trees on file system res_1:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /quota/tree -fs res_1 show -detail
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection
```

```

1:   Path           = /qtree_1
    Description     = this is tree 1
    Space used      = 32768 (32K)
    Soft limit      = 53687091200 (50G)
    Hard limit      = 107374182400 (100G)
    Grace period left = 7d
    State           = OK

2:   Path           = /qtree_2
    Description     =
    Space used      = 32768 (32K)
    Soft limit      = 16384 (16K)
    Hard limit      = 65536 (64K)
    Grace period left = 7d
    State           = Soft limit exceeded

```

Set quota limits for a specific quota tree

You can specify that a specific quota tree inherit the associated file system's default quota limit settings, or you can manually set soft and hard limits on the quota tree.

Format

```


/quota/tree {-fs <value> | -fsName <value>} -path <value> set [-async] [-descr <value>]
[-default | [-softLimit <value>] [-hardLimit <value>]]

```

Object qualifiers

Qualifier	Description
-fs	Specify the ID of the file system.
-fsName	Specify the name of the file system.
-path	Specify the quota tree path, which is relative to the root of the file system.

Action qualifiers

Qualifier	Description
-async	Run the operation in asynchronous mode.
-descr	Quota tree description.
-default	Inherit the default quota limit settings from the associated file system. To view the default limits, use the following command: <pre>/quota/config -fs <value> -path <value> show</pre>
-softLimit	Specify the preferred limit for storage space consumed on the quota tree. A value of 0 means no limitation.
-hardLimit	Specify the absolute limit for storage space consumed on the quota tree. A value of 0 means no limitation.  NOTE: The hard limit should be equal to or larger than the soft limit.

Example

The following command makes the following changes to quota tree /qtree_1 in file system res_1:

- Sets the soft limit is 50 GB.
- Sets the hard limit is to 100 GB.

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /quota/tree -fs res_1 -path /qtree_1 set
-softLimit 50G -hardLimit 100G
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

Operation completed successfully.
```

Refresh all quota trees on a file system

Because there can be a large amount of quota trees on a file system, to reduce the impact on system performance, the system only updates quota data every 24 hours. You can use the refresh action to update the data more often. To view the updating time of the data refresh, see the output field Tree quota update time for the `/quota/config show` command.

Format

```
/quota/tree {-fs <value> | -fsName <value>} refresh [-async]
```

Object qualifier

Qualifier	Description
-fs	Specify the ID of the file system.
-fsname	Specify the name of the file system.

Action qualifier

Qualifier	Description
-async	Run the operation in asynchronous mode.

Example

The following command refreshes quota information for all quota trees on file system `res_1`:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /quota/tree -fs res_1 refresh /
```

```
[Response]
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

Operation completed successfully.
```

Delete quota trees

You can delete all quota trees on a file system or a specified quota tree.

Format

```
/quota/tree {-fs <value> | -fsName <value>} -path <value> delete [-async]
```

Object qualifier

Qualifier	Description
-fs	Specify the ID of the file system.
-fsName	Specify the name of the file system.
-path	Specify either of the following: <ul style="list-style-type: none">• To delete all quota trees on the file system, either do not use this qualifier, or set its value to <code>/</code>.• To delete a specific quota tree, specify the quota tree path relative to the root of the file system.

Action qualifier

Qualifier	Description
-async	Run the operation in asynchronous mode.

Example

The following command deletes quota tree `/qtree_1` on file system `res_1`:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /quota/tree -fs res_1 -path /qtree_1 delete
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection
```

```
Operation completed successfully.
```

Manage quota settings

Managing quota settings includes selecting a quota policy for a file system, setting default limits for a file system or quota tree, setting a default grace period, and disabling the enforcement of space usage limits for a quota tree and user quotas on the tree.

The following table lists the attributes for configuration quota functionality:

Table 107. Attributes for configuring quota functionality

Attribute	Description
Path	Quota tree path relative to the root of the file system. For a file system, either do not use this attribute, or set its value to <code>/</code> .
Quota policy	<p>(Applies to file systems only.) Quota policy for the file system. Valid values are:</p> <ul style="list-style-type: none">• <code>blocks</code>. Calculates space usage in terms of file system blocks (8 KB units). Block usage depends solely on the number of bytes added to or removed from the file. Any operation resulting in allocating or removing blocks, such as creating, expanding, or deleting a directory, writing or deleting files, or creating or deleting symbolic links changes block usage. <p>When using the blocks policy, a user can create a sparse file whose size is larger than the file size, but that uses fewer blocks on the drive.</p> <p>Optionally, use this policy for NFS-only and multiprotocol file systems.</p> <ul style="list-style-type: none">• <code>filesize</code> (default). Calculates space usage in terms of logical file sizes and ignores the size of directories and symbolic links. Use the File policy in the following circumstances:<ul style="list-style-type: none">◦ When you have an SMB-only file system

Table 107. Attributes for configuring quota functionality (continued)

Attribute	Description
	<ul style="list-style-type: none"> When file sizes are critical to quotas, such as when user usage is based on the size of the files created, and exceeding the size limit is unacceptable.
User quota	<p>(Applies to file systems only.) Indicates whether to enforce user quotas on the file system. Valid values are:</p> <ul style="list-style-type: none"> on. Enable the enforcement of user quotas on the file system or quota tree. off. Disable the enforcement of user quotas on the file system or quota tree. <p>NOTE: Because these operations impact system performance, it is recommended that you perform them only during non-peak production hours. When user quota enforcement is enabled, you can change quota settings without impacting performance.</p>
Deny access	<p>Indicates whether to enforce quota space usage limits for the file system. Value is one of the following:</p> <ul style="list-style-type: none"> yes. (Default) Enforce quota space usage limits for the file system or quota tree. When you choose this option, the ability to allocate space is determined by the quota settings. no. Do not enforce quota functionality for the file system or quota tree. When you choose this option, the ability to allocate space will not be denied when a quota limit is crossed.
Grace period	<p>Time period for which the system counts down days once the soft limit is met. If the grace period expires for a file system or quota tree, users cannot write to the file system or quota tree until more space becomes available, even if the hard limit has not been crossed.</p>
Default soft limit	<p>Default preferred limit on storage usage for user quotas on the file system, quota trees in the file system, and user quotas on the quota trees in the file system. The system issues a warning when the soft limit is reached.</p>
Default hard limit	<p>Default hard limit for on storage usage for user quotas on the file system, quota trees in the file system, and user quotas on the quota trees in the file system. If the hard limit is reached for a file system or quota tree, users will not be able to write data to the file system or tree until more space becomes available. If the hard limit is reached for a user quota on a file system or quota tree, that user will not be able to write data to the file system or tree.</p>
Tree quota update time	<p>Tree quota report updating time. The format is YYYY-MM-DD HH:MM:SS.</p>
User quota update time	<p>User quota report updating time. The format is YYYY-MM-DD HH:MM:SS.</p>

Configure quota settings

You can configure quota configuration settings for a file system or quota tree.

Format


```
/quota/config {-fs <value> | -fsName <value>} [-path <value>] set [-async] {-policy {blocks | filesize} | [-userQuota {on | off | clear}] [-gracePeriod <value>] [-defaultSoft <value>] [-defaultHard <value>] [-denyAccess {yes | no}]}
```

Object qualifiers

Qualifier	Description
-fs	Specify the ID of the file system for which you are configuring quota settings. The file system cannot be read-only or a replication destination.
-fsname	Specify the name of the file system for which you are configuring quota settings. The file system cannot be read-only or a replication destination.
-path	Specify the quota tree path relative to the root of the file system. For a file system, either do not use this attribute, or set its value to <code>/</code> .

Action qualifiers

Qualifier	Description
-async	Run the operation in asynchronous mode.
-userQuota	<p>Indicates whether to enforce user quotas on the file system or quota tree. Valid values are:</p> <ul style="list-style-type: none">• <code>on</code> - Enable the enforcement of user quotas on the file system or quota tree.• <code>off</code> - Disable the enforcement of user quotas on the file system or quota tree. When you disable user quotas, the current user quota settings still exist unless you clear them. These settings are automatically reapplied when user quotas are re-enabled.• <code>clear</code> - Clear user quota settings after disabling a user quota. <p>Because enabling and disabling the enforcement of user quotas impacts system performance, it is recommended that you perform these operations only during non-peak production hours. When user quota enforcement is enabled, you can change user quota settings without impacting performance.</p>
-policy	<p>Specify the quota policy for the file system. Valid values are:</p> <ul style="list-style-type: none">• <code>blocks</code> (Blocks policy) - Calculates space usage in terms of file system blocks (8 KB units), and includes drive usage by directories and symbolic links in the calculations.• <code>filesize</code> (File policy) - Calculates space usage in terms of logical file sizes, and ignores the size of directories and symbolic links. <p>For more information, see Configure quota settings on page 349</p>
-gracePeriod	<p>Specify the time period for which the system counts down days once the soft limit is met. If the grace period expires for a quota tree, users cannot write to the quota tree until more space becomes available, even if the hard limit has not been crossed. If the grace period expires for a user quota on a file system or quota tree, the individual user cannot write to the file system or quota tree until more space becomes available for that user. The default grace period is 7 days.</p> <p>The format is:</p> <pre><value><qualifier></pre> <p>where:</p> <ul style="list-style-type: none">• <code>value</code> - An integer value, depending on the associated qualifier:<ul style="list-style-type: none">◦ If the qualifier is <code>m</code> (minutes), the valid range is from 1 to 525600.◦ If the qualifier is <code>h</code> (hours), the valid range is from 1 to 8760.◦ If the qualifier is <code>d</code> (days), the valid range is from 1 to 365.• <code>qualifier</code> - One of the following value qualifiers (case insensitive):<ul style="list-style-type: none">◦ <code>m</code> - Minutes◦ <code>h</code> - Hours◦ <code>d</code> - Days <p>i NOTE: If you update a grace period value, the new value affects only the quota or quotas which will exceed the soft limit after the update is performed. Any existing quotas which have been counting down using the older grace period value will not be affected.</p>

Qualifier	Description
-defaultSoft	Specifies the default preferred limit on storage usage for user quotas on the file system, quota trees in the file system, and user quotas on the quota trees in the file system. The system issues a warning when the soft limit is reached.
-defaultHard	Specify the default hard limit for on storage usage for user quotas on the file system, quota trees in the file system, and user quotas on the file system's quota trees. If the hard limit is reached for a quota tree, users will not be able to write data to the file system or tree until more space becomes available. If the hard limit is reached for a user quota on a file system or quota tree, that particular user will not be able to write data to the file system or tree.  NOTE: The hard limit should be larger than the soft limit.
-denyAccess	Indicates whether to enable quota limits for the file system. Valid values are: <ul style="list-style-type: none"> yes - Enable quota functionality for the file system. When you choose this option, the ability to allocate space is determined by the quota settings. no - Disable quota functionality for the file system. When you choose this option, the ability to allocate space will not be denied when a quota limit is reached.

Example

The following command configures quota tree /qtree_1 in file system res_1 as follows:

- Sets the default grace period to 5 days.
- Sets the default soft limit 10 GB.

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /quota/config -fs res_1 -path /qtree_1  
set -gracePeriod 5d -defaultSoft 10G
```

```
Storage system address: 10.0.0.1  
Storage system port: 443  
HTTPS connection  
  
Operation completed successfully.
```

View quota configuration settings

You can display the quota configuration settings for a file system, a specific quota tree, or a file system and all of its quota trees.

Format

```
/quota/config {-fs <value> | -fsName <value>} [-path <value>] show
```

Object qualifiers

Qualifier	Description
-fs	Specify the ID of the file system.
-fsname	Specify the name of the file system.
-path	Specify the quota tree path relative to the root of the file system. For a file system, either do not use this attribute, or set its value to /. If this value is not specified, the command displays the quota configuration of the file system level and the quota configuration of all quota tree within the specified file system.

Example

The following command lists configuration information for quota tree /quota/config on file system res_1:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /quota/config -fs res_1 show -detail
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

1:   Path                = /
     Quota policy         = blocks
     User quota           = on
     Deny access         = yes
     Grace period         = 7d
     User soft limit      = 53687091200 (50G)
     User hard limit      = 107374182400 (100G)
     Tree quota update time = 2014-10-31 13:17:28
     User quota update time = 2014-10-31 13:20:22

2:   Path                = /qtree_1
     Quota policy         = blocks
     User quota           = on
     Deny access         = yes
     Grace period         = 7d
     User soft limit      = 1073741824 (1G)
     User hard limit      = 10737418240 (10G)
     Tree quota update time =
     User quota update time =
```

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 file system storage. NFS network shares are associated with an NFS file system.

Each NFS share is identified by an ID.

The following table lists the attributes for NFS network shares:

Table 108. 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 path relative to the file system of the directory that the share will provide access to. Default is /root of the file system. A local path must point to an existing directory within the file system.
Export path	Export path, used by hosts to connect to the share.  NOTE: The export path is a combination of the network name or IP address of the associated NAS server and the name of the share.
File system	ID of the parent file system associated with the NFS share.
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">• <code>ro</code> — Hosts have read-only access to primary storage and snapshots associated with the share.• <code>rw</code> — Hosts have read/write access to primary storage and snapshots associated with the share.

Table 108. NFS network share attributes (continued)

Attribute	Description
	<ul style="list-style-type: none"> • <code>roroot</code> — Hosts have read-only access to primary storage and snapshots associated with the share, but the root of the NFS client has root access. • <code>root</code> — Hosts have 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. • <code>na</code> — Hosts have no access to the share or its snapshots.
<code>Advanced host management enabled</code>	<p>Indicates whether host lists are configured by specifying the IDs of registered hosts or by using a string. (A registered host is defined by using the <code>/remote/host</code> command.) Values are (case insensitive):</p> <ul style="list-style-type: none"> • <code>yes</code> (default) — Hosts lists contain the IDs of registered hosts. • <code>no</code> — Host lists contain comma-separated strings, with each string defining a hostname, IP, subnet, netgroup, or DNS domain. <p>For information about specifying host lists by using a string, see Specifying host lists by using a string on page 354.</p>
<code>Read-only hosts</code>	Comma-separated list of hosts that have read-only access to the share and its snapshots. If advanced host management is enabled, this is a list of the IDs of registered hosts. Otherwise, this is a list of network host names, IPs, subnets, domains, or netgroups.
<code>Read/write hosts</code>	Comma-separated list of hosts that have read-write access to the share and its snapshots. If advanced host management is enabled, this is a list of the IDs of registered hosts. Otherwise, this is a list of network host names, IPs, subnets, domains, or netgroups.
<code>Read-only root hosts</code>	Comma-separated list of hosts that have read-only root access to the share and its snapshots. If advanced host management is enabled, this is a list of the IDs of registered hosts. Otherwise, this is a list of network host names, IPs, subnets, domains, or netgroups.
<code>Root hosts</code>	Comma-separated list of hosts that have read-write root access to the share and its snapshots. If advanced host management is enabled, this is a list of the IDs of registered hosts. Otherwise, this is a list of network host names, IPs, subnets, domains, or netgroups.
<code>No access hosts</code>	Comma-separated list of hosts that have no access to the share or its snapshots. If advanced host management is enabled, this is a list of the IDs of registered hosts. Otherwise, this is a list of network host names, IPs, subnets, domains, or netgroups.
<code>Allow SUID</code>	<p>Specifies whether to allow users to set the <code>setuid</code> and <code>setgid</code> Unix permission bits. Values are (case insensitive):</p> <ul style="list-style-type: none"> • <code>yes</code> (default) — Users can set the <code>setuid</code> and <code>setgid</code> Unix permission bits. This allows users to run the executable with privileges of the file owner. • <code>no</code> — Users cannot set the <code>setuid</code> and <code>setgid</code> Unix permission bits.
<code>Anonymous UID</code>	(Applies when the host does not have <code>"allow root"</code> access provided to it.) UID of the anonymous account. This

Table 108. NFS network share attributes (continued)

Attribute	Description
	account is mapped to client requests that arrive with a user ID of 0 (zero), which is typically associated with the user name <code>root</code> . The default value is 4294967294 (-2), which is typically associated with the <code>nobody</code> user (root squash).
Anonymous GID	(Applies when the host does not have "allow root" access provided to it.) GID of the anonymous account. This account is mapped to client requests that arrive with a user ID of 0 (zero), which is typically associated with the user name <code>root</code> . The default value is 4294967294 (-2), which is typically associated with the <code>nobody</code> user (root squash).
Creation time	Creation time of the share.
Last modified time	Last modified time of the share.
Role	The specific usage of the file share. Value is one of the following: <ul style="list-style-type: none">• <code>production</code> — default for source NAS server.• <code>backup</code> — default for destination NAS server. Automatically set for all shares created on a NAS server that is acting as a replication destination. In other cases <code>production</code> is automatically set as a role for the NFS Share
Minimum security	Specifies a minimal security option that must be provided by client for nfs mount operation (in fstab). Value is one of the following, from lower to higher security level: <ul style="list-style-type: none">• <code>sys</code> — No server-side authentication (server relies on NFS client authentication). Without a configured secure NFS for the NAS server this setting is default (aka <code>AUTH_SYS</code> security).• <code>krb5</code> — Kerberos v5 authentication. Default when secure NFS is configured for the NAS server.• <code>krb5i</code> — Kerberos v5 authentication and integrity.• <code>krb5p</code> — Kerberos v5 authentication and integrity; encryption is enabled.

Specifying host lists by using a string

If advanced host management is disabled, a host list can contain a combination of network host names, IP addresses, subnets, netgroups, or DNS domains. The following formatting rules apply:

- An IP address can be an IPv4 or IPv6 address.
- A subnet can be an IP address/netmask or IP address/prefix length (for example: `168.159.50.0/255.255.255.0` or `168.159.50.0/24`).
- The format of the DNS domain follows the UNIX/Linux format; for example, `*.example.com`. When specifying wildcards in fully qualified domain names, dots are not included in the wildcard. For example, `*.example.com` includes `one.example.com`, but does not include `one.two.example.com`.
- To specify that a name is a netgroup name, prepend the name with `@`. Otherwise, it is considered to be a host name.

If advanced host management is enabled, host lists contain the host IDs of existing hosts. You can obtain these IDs by using the `/remote/host` command.

Create NFS network shares

Create an NFS share to export a file system through the NFS protocol.

NOTE: Share access permissions set for specific hosts take effect only if the host-specific setting is less restrictive than the default access setting for the share. Additionally, setting access for a specific host to “No Access” always takes effect over the default access setting.

- Example 1: If the default access setting for a share is Read-Only, setting the access for a specific host configuration to Read/Write will result in an effective host access of Read/Write.
- Example 2: If the default access setting for the share is Read-Only, setting the access permission for a particular host configuration to No Access will take effect and prevent that host from accessing to the share.
- Example 3: If the default access setting for a share is Read-Write, setting the access permission for a particular host configuration to Read-Only will result in an effective host access of Read/Write.

Prerequisite

Configure a file system to which to associate the NFS network shares. [Create file systems](#) on page 329 explains how to create file systems on the system.

Format

```
/stor/prov/fs/nfs create [-async] -name <value> [-descr <value>] {-fs <value> | -fsName <value>} -path <value> [-defAccess {ro | rw | roroot | root | na}] [-advHostMgmtEnabled {yes | no}] [-roHosts <value>] [-rwHosts <value>] [-roRootHosts <value>] [-rootHosts <value>] [-naHosts <value>] [-minSecurity {sys | krb5 | krb5i | krb5p}] [-allowSuid {yes | no}] [-anonUid <value>] [-anonGid <value>]
```

Action qualifiers

Qualifier	Description
-async	Run the operation in asynchronous mode.
-name	<p>Type a name for the share. By default, this value, along with the network name or the IP address of the NAS server, constitutes the export path by which hosts access the share.</p> <p>You can use the forward slash character (/) to create a "virtual" name space that is different from the real path name used by the share. For example, /fs1 and /fs2 can be represented as vol1/fs1 and vol1/fs2. The following considerations apply:</p> <ul style="list-style-type: none"> • You cannot use the / character as the first character of the share name. • An NFSv4 client cannot mount a share using a name that contains the / character. Instead the client must use the share path. To use the share path, you must set the NAS server parameter <code>nfs.showExportLevel</code> to 0 or 1.
-descr	Type a brief description of the share.
-fs	Type the ID of the parent file system associated with the NFS share.
-fsName	Type the name of the parent file system associated with the NFS share.
-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> <ul style="list-style-type: none"> • Each share must have a unique local path. The initial share is created on the root of the file system. • Before you can create additional network shares within an NFS file system, you must create directories within the file system. Connect to the initial NFS share from a host with access to the share and set access permissions accordingly.
-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"> • <code>ro</code> — Hosts have read-only access to primary storage and snapshots associated with the share.

Qualifier	Description
	<ul style="list-style-type: none"> <code>rw</code> — Hosts have read/write access to primary storage and snapshots associated with the share. <code>rooroot</code> — Hosts have read-only access to primary storage and snapshots associated with the share. The root of the NFS client has root access. <code>root</code> — Hosts have 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. <code>na</code> (default) — Hosts have no access to the share or its snapshots.
<code>-advHostMgmtEnabled</code>	<p>Specify whether host lists are configured by specifying the IDs of registered hosts or by using a string. (A registered host is defined by using the <code>/remote/host</code> command.) Values are (case insensitive):</p> <ul style="list-style-type: none"> <code>yes</code> (default) — Hosts lists contain the IDs of registered hosts. <code>no</code> — Host lists contain comma-separated strings, with each string defining a hostname, IP, subnet, netgroup, or DNS domain. <p>For information about specifying host lists by using a string, see Specifying host lists by using a string on page 354.</p>
<code>-roHosts</code>	Type the IDs of hosts that have read-only access to the share and its snapshots. Separate the IDs with commas. If advanced host management is enabled, this is a list of the IDs of registered hosts. Otherwise, this is a list of network host names, IPs, subnets, domains, or netgroups.
<code>-rwHosts</code>	Type the IDs of hosts that have read-write access to the share and its snapshots. Separate the IDs with commas. If advanced host management is enabled, this is a list of the IDs of registered hosts. Otherwise, this is a list of network host names, IPs, subnets, domains, or netgroups.
<code>-roRootHosts</code>	Type the IDs of hosts that have read-only root access to the share and its snapshots. Separate the IDs with commas. If advanced host management is enabled, this is a list of the IDs of registered hosts. Otherwise, this is a list of network host names, IPs, subnets, domains, or netgroups.
<code>-rootHosts</code>	Type the IDs of hosts that have read-write root access to the share and its snapshots. Separate the IDs with commas. If advanced host management is enabled, this is a list of the IDs of registered hosts. Otherwise, this is a list of network host names, IPs, subnets, domains, or netgroups.
<code>-naHosts</code>	Type the ID of each host configuration for which you want to block access to the share and its snapshots. Separate the IDs with commas. If advanced host management is enabled, this is a list of the IDs of registered hosts. Otherwise, this is a list of network host names, IPs, subnets, domains, or netgroups.
<code>-minSecurity</code>	<p>Specify a minimal security option that must be provided by client for nfs mount operation (in <code>fstab</code>). Value is one of the following, from lower to higher security level. All higher security levels are supported, and can be enforced by the client at negotiations for secure NFS access.</p> <ul style="list-style-type: none"> <code>sys</code> — No server-side authentication (server relies on NFS client authentication). Without a configured secure NFS for the NAS server this setting is default. <code>krb5</code> — Kerberos v5 authentication. Default when secure NFS is configured for the NAS server. <code>krb5i</code> — Kerberos v5 authentication and integrity. <code>krb5p</code> — Kerberos v5 authentication and integrity; encryption is enabled.
<code>-allowSuid</code>	<p>Specifies whether to allow users to set the <code>setuid</code> and <code>setgid</code> Unix permission bits. Values are (case insensitive):</p> <ul style="list-style-type: none"> <code>yes</code> (default) — Users can set the <code>setuid</code> and <code>setgid</code> Unix permission bits. This allows users to run the executable with privileges of the file owner. <code>no</code> — Users cannot set the <code>setuid</code> and <code>setgid</code> Unix permission bits.
<code>-anonUid</code>	Specify the UID of the anonymous account.
<code>-anonGid</code>	Specify the GID of the anonymous account.

Example 1

The following command shows output for when the path is not found because the path does not start with "/", and the shares are not created successfully.

```
uemcli -u admin -p Password123! /stor/prov/fs/nfs create -name testnfs112 -fs res_26 -path "/mypath"
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

Operation failed. Error code: 0x900a002
The system could not find the specified path. Please use an existing path. (Error
Code:0x900a002)
Job ID = N-1339
```

Example 2

The following command shows output for when the path is correctly specified and the shares are successfully created. The new NFS share has the following settings:

- NFS share name of "testnfs112"
- Parent file system of "res_26"
- On the directory "/mypath"

```
uemcli -u admin -p Password123! /stor/prov/fs/nfs create -name testnfs112 -fs res_26 -path "/mypath"
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

ID = NFSShare_20
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 file system ID.

 **NOTE:** The [show action command](#) on page 21 explains how to change the output format.

Format

```
/stor/prov/fs/nfs [{-id <value> | -name <value> | -fs <value> | -fsName <value>}] show
```

Object qualifiers

Qualifier	Description
-id	Type the ID of an NFS share.
-name	Type the name of an NFS share.
-fs	Type the ID of an NFS file system to view the associated NFS network shares.
-fsName	Type the name of an NFS file system 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/fs/nfs show -detail
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

1:      ID              = NFSShare_1
      Name              = MyNFSShare1
      Description        = My nfs share
      File system        = res_26
      Local path         = /mypath
      Export path        = SATURN.domain.emc.com:/MyNFSShare1
      Default access     = na
      Advanced host mgmt. = yes
      Read-only hosts    = 1014, 1015
      Read/write hosts   = 1016
      Read-only root hosts =
      Root hosts        =
      No access hosts    =
      Creation time      = 2012-08-24 12:18:22
      Last modified time = 2012-08-24 12:18:22
      Role               = production
      Minimum security   = krb5
      Allow SUID          = yes
      Anonymous UID      = 4294967294
      Anonymous GID      = 4294967294
```

Change NFS share settings

Change the settings of an NFS share.

Format

```
/stor/prov/fs/nfs {-id <value> | -name <value>} set [-async][-descr <value>] [-defAccess {ro | rw | roroot | root | na}] [-advHostMgmtEnabled {yes | no}] [-roHosts <value>] [-rwHosts <value>] [-roRootHosts <value>] [-rootHosts <value>] [-naHosts <value>] [-minSecurity {sys | krb5 | krb5i | krb5p}] [- allowSuid { yes | no }] [-anonUid <value>] [-anonGid <value>]
```

Object qualifiers

Qualifier	Description
-id	Type the ID of an NFS share to change. View NFS share settings on page 357 explains how to view the IDs of the NFS network shares on the system.
-name	Type the name of an NFS share to change.

Action qualifiers

Qualifier	Description
-async	Run the operation in asynchronous mode.
-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:

Qualifier	Description
	<ul style="list-style-type: none"> • <code>ro</code> – Hosts have read-only access to primary storage and snapshots associated with the share. • <code>rw</code> – Hosts have read/write access to primary storage and snapshots associated with the share. • <code>rooroot</code> – Hosts have read-only root access to primary storage and snapshots associated with the share. • <code>root</code> – Hosts have 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. • <code>na</code> – Hosts have no access to the share or its snapshots.
<code>-advHostMgmtEnabled</code>	<p>Specify whether host lists are configured by specifying the IDs of registered hosts or by using a string. (A registered host is defined by using the <code>/remote/host</code> command.) Values are (case insensitive):</p> <ul style="list-style-type: none"> • <code>yes</code> (default) — Hosts lists contain the IDs of registered hosts. • <code>no</code> — Host lists contain comma-separated strings, with each string defining a hostname, IP, subnet, netgroup, or DNS domain
<code>-roHosts</code>	Type the IDs of hosts that have read-only access to the share and its snapshots. Separate the IDs with commas. If advanced host management is enabled, this is a list of the IDs of registered hosts. Otherwise, this is a list of network host names, IPs, subnets, domains, or netgroups.
<code>-rwHosts</code>	Type the IDs of hosts that have read-write access to the share and its snapshots. Separate the IDs with commas. If advanced host management is enabled, this is a list of the IDs of registered hosts. Otherwise, this is a list of network host names, IPs, subnets, domains, or netgroups.
<code>-roRootHosts</code>	Type the IDs of hosts that have read-only root access to the share and its snapshots. Separate the IDs with commas. If advanced host management is enabled, this is a list of the IDs of registered hosts. Otherwise, this is a list of network host names, IPs, subnets, domains, or netgroups.
<code>-rootHosts</code>	Type the IDs of hosts that have read-write root access to the share and its snapshots. Separate the IDs with commas. If advanced host management is enabled, this is a list of the IDs of registered hosts. Otherwise, this is a list of network host names, IPs, subnets, domains, or netgroups.
<code>-naHosts</code>	Type the ID of each host configuration for which you want to block access to the share and its snapshots. Separate the IDs with commas. If advanced host management is enabled, this is a list of the IDs of registered hosts. Otherwise, this is a list of network host names, IPs, subnets, domains, or netgroups
<code>-minSecurity</code>	<p>Specifies a minimal security option that must be provided by client for NFS mount operation. Value is one of the following, from lower to higher security level. All higher security levels are supported, and can be enforced by the client at negotiations for secure NFS access.</p> <ul style="list-style-type: none"> • <code>sys</code> - No server-side authentication (server relies on NFS client authentication). Also known as <code>AUTH_SYS</code> security. • <code>krb5</code> - Kerberos v5 authentication. • <code>krb5i</code> - Kerberos v5 authentication and integrity. • <code>krb5p</code> - Kerberos v5 authentication and integrity; encryption is enabled.
<code>-allowSuid</code>	<p>Specifies whether to allow users to set the <code>setuid</code> and <code>setgid</code> Unix permission bits. Values are (case insensitive):</p> <ul style="list-style-type: none"> • <code>yes</code> (default) Users can set the <code>setuid</code> and <code>setgid</code> Unix permission bits. This allows users to run the executable with privileges of the file owner. • <code>no</code> - Users cannot set the <code>setuid</code> and <code>setgid</code> Unix permission bits.
<code>-anonUid</code>	Specify the UID of the anonymous account.
<code>-anonGid</code>	Specify the GID of the anonymous account.

Example

The following command changes NFS share NFSShare_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/fs/nfs -id NFSShare_1 set -
descr "My share" -naHosts "HOST_1"
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

ID = NFSShare_1
Operation completed successfully.
```

Delete NFS network shares

Delete an NFS share.

Format

```
/stor/prov/fs/nfs {-id <value> | -name <value>} delete [-async]
```

Object qualifiers

Qualifier	Description
-id	Type the ID of an NFS share to change. View NFS share settings on page 357 explains how to view the IDs of the NFS network shares on the system.
-name	Type the name of an NFS share to change.

Action qualifier

Qualifier	Description
-async	Run the operation in asynchronous mode.

Example

The following command deletes NFS share NFSShare_1:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /stor/prov/fs/nfs -id NFSShare_1 delete
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

Operation completed successfully.
```

Manage SMB network shares

Server Message Block (SMB) network shares use the SMB (formerly known as CIFS) protocol to provide an access point for configured Windows hosts, or IP subnets, to access file system storage. SMB network shares are associated with a SMB file system.

Each SMB share is identified by an ID.

The following table lists the attributes for SMB network shares:

Table 109. SMB 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 within the file system that the share provides access to.
Export path	Export path, used by hosts to connect to the share. NOTE: The export path is a combination of the network name or the IP address of the associated NAS server and the name of the share.
File system	ID of the parent file system associated with the SMB share.
Creation time	Creation time of the share.
Last modified time	Last modified time of the share.
Availability enabled	Continuous availability state.
Encryption enabled	SMB encryption state.
Umask	Indicates the default Unix umask for new files created on the share. If not specified, the umask defaults to 022.
ABE enabled	Indicates whether an Access-Based Enumeration (ABE) filter is enabled. Valid values include: <ul style="list-style-type: none"> yes — Filters the list of available files and folders on a share to include only those that the requesting user has access to. no (default)
DFS enabled	Indicates whether Distributed File System (DFS) is enabled. Valid values include: <ul style="list-style-type: none"> yes — Allows administrators to group shared folders located on different shares by transparently connecting them to one or more DFS namespaces. no (default)
BranchCache enabled	Indicates whether BranchCache is enabled. Valid values include: <ul style="list-style-type: none"> yes — Copies content from the main office or hosted cloud content servers and caches the content at branch office locations. This allows client computers at branch offices to access content locally rather than over the WAN. no (default)
Offline availability	Indicates whether Offline availability is enabled. When enabled, users can use this feature on their computers to work with shared folders stored on a server, even when they are not connected to the network. Valid values include: <ul style="list-style-type: none"> none — Prevents clients from storing documents and programs in offline cache. (default) documents — All files that clients open from the share will be available offline. programs — All programs and files that clients open from the share will be available offline. Programs and files will preferably open from offline cache, even when connected to the network. manual — Only specified files will be available offline.

Create CIFS network shares

Create a CIFS (SMB) share to export a file system through the CIFS protocol.


Prerequisite

Configure a file system to which to associate the CIFS network shares. [Create file systems](#) on page 329 explains how to create file systems on the system.

Format

```
/stor/prov/fs/cifs create [-async] -name <value> [-descr <value>] {-fs <value> | -fsName <value>} -path <value> [-enableContinuousAvailability {yes|no}] [-enableCIFSEncryption {yes|no}] [-umask <value> ] [-enableABE {yes | no} ] [-enableBranchCache {yes | no}] [-offlineAvailability {none | documents | programs | manual} ]
```

Action qualifiers

Qualifier	Description
-async	Run the operation in asynchronous mode.
-name	Type a name for the share.  NOTE: This value, along with the name of the NAS server, constitutes the export path by which hosts access the share.
-descr	Type a brief description of the share.
-fs	Type the ID of the parent file system associated with the CIFS share.
-fsName	Type the name of the parent file system associated with the CIFS share.
-path	Type the path to the directory within the file system that will be shared. This path must correspond to an existing directory/folder name within the share that was created from the host-side. The default path is the root of the file system. Local paths must point to an existing directory within the file system. <ul style="list-style-type: none">• The same path on a file system can be shared an unlimited number of times, but each share name must be unique. The initial share will be created on the file system root directory.• Before you can create additional network shares or subdirectories within an NFS file system, you must create network shares or subdirectories within it from a Windows host that is connected to the file system. After a share has been created from a mounted host, you can create a corresponding share on the system and set access permissions accordingly.
-enableContinuousAvailability	Specify whether continuous availability is enabled.
-enableCIFSEncryption	Specify whether CIFS encryption is enabled.
-umask	Type the default Unix umask for new files created on the share.
-enableABE	Specify if Access-based Enumeration (ABE) is enabled. Valid values include: <ul style="list-style-type: none">• yes• no (default)
-enableBranchCache	Specify if BranchCache is enabled. Valid values include: <ul style="list-style-type: none">• yes• no (default)
-offlineAvailability	Specify the type of offline availability. Valid values include: <ul style="list-style-type: none">• none (default) — Prevents clients from storing documents and programs in offline cache.

Qualifier	Description
	<ul style="list-style-type: none"> • <code>documents</code> — Allows all files that clients open to be available offline. • <code>programs</code> — Allows all programs and files that clients open to be available offline. Programs and files will open from offline cache, even when connected to the network. • <code>manual</code> — Allows only specified files to be available offline.

Example

The following command creates a CIFS share with these settings:

- Name is CIFSshare.
- Description is "My share."
- Associated to file system `res_1`.
- Local path on the file system is directory `"/cifsshare"`.
- Continuous availability is enabled.
- CIFS encryption is enabled.

The share receives ID `CIFSshare_1`:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /stor/prov/fs/cifs create -name
CIFSshare -descr "My share" -fs fs1 -path "/cifsshare" -enableContinuousAvailability yes
-enableCIFSEncryption yes
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection
```

```
ID = CIFS_1
Operation completed successfully.
```

View CIFS share settings

View details of a CIFS (SMB) share. You can filter on the CIFS share ID or view the CIFS network shares associated with a file system ID.

 **NOTE:** The `show` action command on page 21 explains how to change the output format.

Format

```
/stor/prov/fs/cifs [{-id <value> | -name <value> | -fs <value> | -fsName <value>}]show
```

Object qualifiers

Qualifier	Description
<code>-id</code>	Type the ID of a CIFS share.
<code>-name</code>	Type the name of a CIFS share.
<code>-fs</code>	Type the ID of a CIFS file system to view the associated CIFS network shares.
<code>-fsName</code>	Type the name of a CIFS file system to view the associated CIFS network shares.

Example

The following command lists details for all CIFS network shares on the system:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /stor/prov/fs/cifs show
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

1:      ID          = SMBShare_1
      Name          = fsmup
      Description   =
      File system   = res_1
      Local path    = /
      Export path   = \\sys-123.abc.xyz123.test.lab.emc.com\fsmup, \\10.0.0.0\fsmup

2:      ID          = SMBShare_2
      Name          = fsmup
      Description   =
      File system   = res_5
      Local path    = /
      Export path   = \\sys-123.abc.xyz123.test.lab.emc.com\fsmup, \\10.0.0.0\fsmup
```

Change CIFS share settings

Change the settings of an CIFS (SMB) share.

Format

```
/stor/prov/fs/cifs {-id <value> | -name <value>} set [-async] -name <value> [-descr
<value>] [-enableContinuousAvailability {yes|no}] [-enableCIFSEncryption {yes|no}] [-umask
<value>] [-enableABE {yes | no}] [-enableBranchCache {yes | no}] [-offlineAvailability
{none | documents | programs | manual}] ]
```

Object qualifiers

Qualifier	Description
-id	Type the ID of a CIFS share to change.
-name	Type the name of a CIFS share to change.

Action qualifier

Qualifier	Description
-async	Run the operation in asynchronous mode.
-descr	Specifies the description for the CIFS share.
-enableContinuousAvailability	Specifies whether continuous availability is enabled.
-enableCIFSEncryption	Specifies whether CIFS encryption is enabled.
-umask	Type the default Unix umask for new files created on the share.
-enableABE	Specify if Access-Based Enumeration (ABE) is enabled. Valid values include: <ul style="list-style-type: none">• yes• no
-enableBranchCache	Specify if BranchCache is enabled. Valid values include: <ul style="list-style-type: none">• yes• no
-offlineAvailability	Specify the type of offline availability. Valid values include:

Qualifier	Description
	<ul style="list-style-type: none"> • <code>none</code> — Prevents clients from storing documents and programs in offline cache. • <code>documents</code> — Allows all files that users open to be available offline. • <code>programs</code> — Allows all programs and files that users open to be available offline. Programs and files will open from offline cache, even when connected to the network. • <code>manual</code> — Allows only specified files to be available offline.

Example

The following command sets the description of CIFS share SMBShare_1 to `My share`.

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /stor/prov/fs/cifs -id SMBShare_1 set -descr "My share"
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection
```

```
ID = SMBShare_1
Operation completed successfully.
```

Delete CIFS network shares

Delete a CIFS (SMB) share.

Format

```
/stor/prov/fs/cifs {-id <value> | -name <value>} delete [-async]
```

Object qualifiers

Qualifier	Description
<code>-id</code>	Type the ID of a CIFS share to delete.
<code>-name</code>	Type the name of a CIFS share to delete.

Action qualifier

Qualifier	Description
<code>-async</code>	Run the operation in asynchronous mode.

Example

The following command deletes CIFS share CIFSShare_1:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /stor/prov/fs/cifs -id CIFSShare_1 delete
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection
```

```
Operation completed successfully.
```

Manage LUNs

A LUN is a single unit of storage that represents a specific storage pool and quantity of Fibre Channel (FC) or iSCSI storage. Each LUN is associated with a name and logical unit number identifier (LUN ID).

The following table lists the attributes for LUNs:

Table 110. LUN attributes

Attribute	Description
ID	ID of the LUN.
Name	Name of the LUN.
Description	Brief description of the LUN.
Group	Name of the consistency group of which the LUN is a member.
Storage pool ID	ID of the storage pool the LUN is using.
Storage pool	Name of the storage pool the LUN is using.
Type	Type of LUN. Value is one of the following (case insensitive): <ul style="list-style-type: none">• Primary• Thin clone (tc when used with the <code>-create</code> command.)
Base storage resource	(Applies to thin clones only) ID of the base LUN for the thin clone.
Source	(Applies to thin clones only) ID of the source snapshot for the thin clone.
Original parent	(Applies to thin clones only) ID of the parent LUN for the thin clone.
Health state	Health state of the LUN. The health state code appears in parentheses. Value is one of the following: <ul style="list-style-type: none">• OK (5) —The LUN is operating normally.• Degraded/Warning (10) —Working, but one or more of the following may have occurred:<ul style="list-style-type: none">◦ One or more of its storage pools are degraded.◦ Resource is degraded.◦ Resource is running out of space and needs to be increased.• Minor failure (15) —One or both of the following may have occurred:<ul style="list-style-type: none">◦ One or more of its storage pools have failed.◦ Resource is unavailable.• Major failure (20) —One or both of the following may have occurred:<ul style="list-style-type: none">◦ One or more of its storage pools have failed.◦ Resource is unavailable.• Critical failure (25) —One or more of the following may have occurred:<ul style="list-style-type: none">◦ One or more of its storage pools are unavailable.◦ Resource is unavailable.◦ Resource has run out of space and needs to be increased.• Non-recoverable error (30) —One or both of the following may have occurred:<ul style="list-style-type: none">◦ One or more of its storage pools are unavailable.◦ Resource is unavailable.
Health details	Additional health information.
Size	Current size of the LUN.
Maximum size	Maximum size of the LUN.
Thin provisioning enabled	Identifies whether thin provisioning is enabled. Valid values are: <ul style="list-style-type: none">• yes

Table 110. LUN attributes (continued)







Attribute	Description
	<ul style="list-style-type: none"> no (default) <p>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 subscribed to support more storage capacity than they actually possess.</p> <p> NOTE: The Unisphere online help provides more details on thin provisioning.</p>
Data Reduction enabled	<p>Identifies whether data reduction is enabled. Valid values are:</p> <ul style="list-style-type: none"> yes no (default) <p> NOTE: Data reduction is available for thin LUNs in an All-Flash pool only.</p>
Data Reduction space saved	<p>Total space saved for the LUN (in gigabytes) by using data reduction.</p> <p> NOTE: Data reduction is available for thin LUNs in an All-Flash pool only.</p>
Data Reduction percent	<p>Total storage percentage saved for the LUN by using data reduction.</p> <p> NOTE: Data reduction is available for thin LUNs in an All-Flash pool only.</p>
Data Reduction ratio	<p>Ratio between data without data reduction and data after data reduction savings.</p> <p> NOTE: Data reduction is available for thin LUNs in an All-Flash pool only.</p>
Advanced deduplication enabled	<p>Identifies whether advanced deduplication is enabled for this LUN. This option is available only after data reduction has been enabled. An empty value indicates that advanced deduplication is not supported on the LUN. Valid values are:</p> <ul style="list-style-type: none"> yes no (default) <p> NOTE: Advanced deduplication is available only on:</p> <ul style="list-style-type: none"> Dynamic or Traditional pools in Unity 380F, 480F, 680F, and 880F systems Dynamic pools in Unity All-Flash 450F, 550F, and 650F systems All-Flash pools in Unity Hybrid 380, 480, 680, and 880 systems
Current allocation	<p>If thin provisioning is enabled, the quantity of primary storage currently allocated through thin provisioning.</p>
Total pool space preallocated	<p>Space reserved from the pool by the LUN for future needs to make writes more efficient. The pool may be able to reclaim some of this space if unused and pool space is running low.</p>
Total pool space used	<p>Total pool space used by the LUN.</p>
Non-base size used	<p>(Applies to standard LUNs only) Quantity of the storage used for the snapshots and thin clones associated with this LUN.</p>
Family size used	<p>(Applies to standard LUNs only) Quantity of the storage used for the whole LUN family.</p>
Snapshot count	<p>Number of snapshots created on the LUN.</p>
Family snapshot count	<p>(Applies to standard LUNs only) Number of snapshots created in the LUN family, including all derivative snapshots.</p>
Family thin clone count	<p>(Applies to standard LUNs only) Number of thin clones created in the LUN family, including all derivative thin clones.</p>
Protection schedule	<p>ID of a protection schedule applied to the LUN. View protection schedules on page 90 explains how to view the IDs of the schedules on the system.</p>

Table 110. LUN attributes (continued)

Attribute	Description
Protection schedule paused	Identifies whether an applied protection schedule is currently paused.
WWN	World Wide Name of the LUN.
Replication destination	Identifies whether the storage resource is a destination for a replication session (local or remote). Valid values are: <ul style="list-style-type: none"> • yes • no
Creation time	Time the resource was created.
Last modified time	Time the resource was last modified.
SP owner	Identifies the default owner of the LUN. Value is SP A or SP B.
Trespassed	Identifies whether the LUN is trespassed to the peer SP. Valid values are: <ul style="list-style-type: none"> • yes • no
FAST VP policy	FAST VP tiering policy for the LUN. This policy defines both the initial tier placement and the ongoing automated tiering of data during data relocation operations. Valid values (case-insensitive): <ul style="list-style-type: none"> • startHighThenAuto (default)—Sets the initial data placement to the highest-performing drives with available space, and then relocates portions of the storage resource's data based on I/O activity. • auto—Sets the initial data placement to an optimum, system-determined setting, and then relocates portions of the storage resource's data based on the storage resource's performance statistics such that data is relocated among tiers according to I/O activity. • highest—Sets the initial data placement and subsequent data relocation (if applicable) to the highest-performing drives with available space. • lowest—Sets the initial data placement and subsequent data relocation (if applicable) to the most cost-effective drives with available space.
FAST VP distribution	Percentage of the LUN assigned to each tier. The format is: <tier_name>:<value>% where: <ul style="list-style-type: none"> • <tier_name> is the name of the storage tier. • <value> is the percentage of storage in that tier.
LUN access hosts	List of hosts with access permissions to the LUN.
Host LUN IDs	Comma-separated list of HLUs (Host LUN identifiers), which the corresponding hosts use to access the LUN.
Snapshots access hosts	List of hosts with access to snapshots of the LUN.
IO limit	Name of the host I/O limit policy applied.
Effective maximum IOPS	The effective maximum IO per second for the LUN. For LUNs with a density-based IO limit policy, this value is equal to the product of the Maximum IOPS and the Size of the attached LUN.
Effective maximum KBPS	The effective maximum KBs per second for the LUN. For LUNs with a density-based IO limit policy, this value is equal to the product of the Maximum KBPS and the Size of the attached LUN.

Create LUNs

Create a LUN to which host initiators connect to access storage.




Prerequisites



Configure at least one storage pool for the LUN to use and allocate at least one drive to the pool. [Configure custom pools](#) on page 288 explains how to create a custom storage pool on the system.

Format

```
/stor/prov/luns/lun create [-async] -name <value> [-descr <value>] [-type {primary | tc  
{-source <value> | -sourceName <value>}} [{-group <value> | groupName <value>}}] [ {-  
pool <value> | -poolName <value>}}] [-size <value>] [-thin {yes | no}] [-sched <value> [-  
schedPaused {yes | no}]] [-spOwner {spa | spb}] [-fastvpPolicy {startHighThenAuto | auto |  
highest | lowest}] [-lunHosts <value> [-hplus <value>]] [-snapHosts <value>] [-replDest {yes  
| no}] [-ioLimit <value>] [-dataReduction {yes [-advancedDedup {yes | no}] | no}]
```

Action qualifiers

Qualifier	Description
-async	Run the operation in asynchronous mode.
-name	Type the name of the LUN.
-descr	Type a brief description of the LUN.
-type	Specify the type of LUN. Valid values are (case insensitive): <ul style="list-style-type: none">• primary (default)• tc
-source	(Applies to thin clones only) Specify the ID of the source object to use for thin clone creation.
-sourceName	(Applies to thin clones only) Specify the name of the source object to use for thin clone creation.
-group	(Not applicable when creating a thin clone) Type the ID of a consistency group to which to associate the new LUN. View consistency groups on page 380 explains how to view information on consistency groups.  NOTE: If no consistency group is specified with -group or -groupName, the LUN is not assigned to a consistency group.
-groupName	(Not applicable when creating a thin clone) Type the name of a consistency group to which to associate the new LUN.  NOTE: If no consistency group is specified with -group or -groupName, the LUN is not assigned to a consistency group.
-pool	(Not applicable when creating a thin clone) Type the ID of the storage pool that the LUN will use.  NOTE: Value is case-insensitive. View pools on page 296 explains how to view the names of the storage pools on the system.
-poolName	(Not applicable when creating a thin clone) Type the name of the storage pool that the LUN will use.
-size	(Not applicable when creating a thin clone) Type the quantity of storage to allocate for the LUN.
-thin	(Not applicable when creating a thin clone) Enable thin provisioning on the LUN. Valid values are: <ul style="list-style-type: none">• yes• no (default)
-sched	Type the ID of a protection schedule to apply to the storage resource. View protection schedules on page 90 explains how to view the IDs of the schedules on the system.
-schedPaused	Pause the schedule specified for the -sched qualifier. Valid values are: <ul style="list-style-type: none">• yes• no (default)

Qualifier	Description
-spOwner	(Not applicable when creating a thin clone) Specify the default SP to which the LUN will belong. The storage system determines the default value. Valid values are: <ul style="list-style-type: none"> • spa • spb
-fastvpPolicy	(Not applicable when creating a thin clone) Specify the FAST VP tiering policy for the LUN. This policy defines both the initial tier placement and the ongoing automated tiering of data during data relocation operations. Valid values (case-insensitive): <ul style="list-style-type: none"> • startHighThenAuto (default)—Sets the initial data placement to the highest-performing drives with available space, and then relocates portions of the storage resource's data based on I/O activity. • auto—Sets the initial data placement to an optimum, system-determined setting, and then relocates portions of the storage resource's data based on the storage resource's performance statistics such that data is relocated among tiers according to I/O activity. • highest—Sets the initial data placement and subsequent data relocation (if applicable) to the highest-performing drives with available space. • lowest—Sets the initial data placement and subsequent data relocation (if applicable) to the most cost-effective drives with available space.
-lunHosts	Specify a comma-separated list of hosts with access to the LUN.
-hlus	Specifies the comma-separated list of Host LUN identifiers to be used by the corresponding hosts which were specified in the -lunHosts option. The number of items in the two lists must match. However, an empty string is a valid value for any element of the Host LUN identifiers list, as long as commas separate the list elements. Such an empty element signifies that the system should automatically assign the Host LUN identifier value by which the corresponding host will access the LUN. If not specified, the system will automatically assign the Host LUN identifier value for every host specified in the -lunHosts argument list.
-snapHosts	Specify a comma-separated list of hosts with access to snapshots of the LUN.
-replDest	(Not applicable when creating a thin clone) Specifies whether the resource is a replication destination. Valid values are: <ul style="list-style-type: none"> • yes • no (default)
-ioLimit	Specify the name of the host I/O limit policy to be applied.
-dataReduction	(Not applicable when creating a thin clone) Specify whether data reduction is enabled for this LUN. Valid values are: <ul style="list-style-type: none"> • yes • no (default) <p> NOTE: Data reduction is available for thin LUNs in an All-Flash pool only.</p>
-advancedDedup	Specify whether advanced deduplication is enabled for this LUN. This option is available only after data reduction has been enabled. An empty value indicates that advanced deduplication is not supported on the LUN. Valid values are: <ul style="list-style-type: none"> • yes • no (default) <p> NOTE: Advanced deduplication is available only on:</p> <ul style="list-style-type: none"> • Dynamic or Traditional pools in Unity 380F, 480F, 680F, and 880F systems • Dynamic pools in Unity All-Flash 450F, 550F, and 650F systems • All-Flash pools in Unity Hybrid 380, 480, 680, and 880 systems

Example 1

The following command creates a LUN with these settings:

- Name is MyLUN.

- Description is "My LUN."
- Associated with LUN consistency group group_1.
- Uses the pool_1 storage pool.
- Primary storage size is 100 MB.

The LUN receives the ID lun_1:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /stor/prov/luns/lun create -name "MyLUN"
-descr "My LUN" -type primary -group group_1 -pool pool_1 -size 100M

Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

ID = lun_1
Operation completed successfully.
```

Example 2

The following command creates a thin clone called MyTC from SNAP_1. The thin clone receives the ID lun_3.

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /stor/prov/luns/lun create -name "MyTC"
-descr "My FC" -type tc -source SNAP_1

Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

ID = lun_3
Operation completed successfully.
```

View LUNs

Display the list of existing LUNs.

 **NOTE:** The `show action command` on page 21 explains how to change the output format.

Format

```
/stor/prov/luns/lun [{-id <value> | name <value> | -group <value> | -groupName <value>
| -standalone}] [-type {primary | tc [{-baseRes <value> | -baseResName <value> | -
originalParent <value> | -originalParentName <value> | -source <value> | -sourceName
<value>}}]] show
```

Object qualifiers

Qualifier	Description
-id	Type the ID of a LUN.
-name	Type the name of a LUN.
-group	Type the ID of a consistency group. The list of LUNs in the specified consistency group are displayed.
-groupName	Type the name of a consistency group. The list of LUNs in the specified consistency group are displayed.
-standalone	Displays only LUNs that are not part of a consistency group.
-type	Identifies the type of resources to display. Valid values are (case insensitive):

Qualifier	Description
	<ul style="list-style-type: none"> • primary • tc
-baseRes	(Applies to thin clones only) Type the ID of a base LUN by which to filter thin clones.
-baseResName	(Applies to thin clones only) Type the name of a base LUN by which to filter thin clones.
-originalParent	(Applies to thin clones only) Type the ID of a parent LUN by which to filter thin clones.
-originalParentName	(Applies to thin clones only) Type the name of a parent LUN by which to filter thin clones.
-source	(Applies to thin clones only) Type the ID of a source snapshot by which to filter thin clones.
-sourceName	(Applies to thin clones only) Type the name of a source snapshot by which to filter thin clones.

Example 1

The following command displays information about all LUNs and thin clones on the system:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /stor/prov/luns/lun show -detail
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

1:      ID                      = sv_1
      Name                     = AF_LUN 1
      Description               =
      Group                    =
      Storage pool ID          = pool_1
      Storage pool             = Pool_1
      Type                     = Primary
      Base storage resource     = sv_1
      Source                   =
      Original parent          =
      Health state             = OK (5)
      Health details           = "The LUN is operating normally. No action is
required."
      Size                     = 21474836480 (20.0G)
      Maximum size             = 281474976710656 (256.0T)
      Thin provisioning enabled = yes
      Compression enabled      = yes
      Compression space saved  = 5637144576 (5.2G)
      Compression percent      = 44%
      Compression ratio        = 1.8:1
      Data Reduction enabled   = yes
      Data Reduction space saved = 5637144576 (5.2G)
      Data Reduction percent    = 44%
      Data Reduction ratio     = 1.8:1
      Advanced deduplication enabled = no
      Current allocation       = 4606345216 (4.2G)
      Protection size used     = 0
      Non-base size used       = 0
      Family size used         = 12079595520 (11.2G)
      Snapshot count           = 2
      Family snapshot count    = 2
      Family thin clone count  = 0
      Protection schedule      = snapSch_1
      Protection schedule paused = no
      WWN                     = 60:06:01:60:10:00:43:00:B7:15:A5:5B:B1:7C:01:2B
      Replication destination  = no
      Creation time            = 2018-09-21 16:00:55
      Last modified time       = 2018-09-21 16:01:41
      SP owner                  = SPB
      Trespassed               = no
      LUN access hosts         = Host_2
      Host LUN IDs             = 0
      Snapshots access hosts   =
      IO limit                 =
```

Effective maximum IOPS	= N/A
Effective maximum KBPS	= N/A

Change LUNs

Change the settings for a LUN.



Format

```
/stor/prov/luns/lun {-id <value> | -name <value>} set [-async] [-name <value>] [-descr <value>] [-size <value>] [{-group <value> | -groupName <value> | -standalone}] [{-sched <value> | -noSched}] [-schedPaused {yes | no}] [-spOwner {spa | spb}] [-fastvpPolicy {startHighThenAuto | auto | highest | lowest}] [-lunHosts <value> [-hlus <value>]] [-snapHosts <value>] [-replDest {yes | no}] [-ioLimit <value> | -noIoLimit] [-dataReduction {yes [-advancedDedup {yes | no}] | no}]
```

Object qualifiers

Qualifier	Description
-id	Type the ID of the LUN to change.
-name	Type the name of the LUN to change.

Action qualifiers

Qualifier	Description
-async	Run the operation in asynchronous mode.
-name	Type the name of the LUN.
-descr	Type a brief description of the LUN.
-group	(Not applicable to thin clones) Type the ID of a consistency group to which to associate the new LUN. View consistency groups on page 380 explains how to view information on consistency groups.  NOTE: If no consistency group is specified with -group or -groupName, the LUN is not assigned to a consistency group.
-groupName	(Not applicable to thin clones) Type the name of a consistency group to which to associate the new LUN.  NOTE: If no consistency group is specified with -group or -groupName, the LUN is not assigned to a consistency group.
-size	Type the quantity of storage to allocate for the LUN.
-standalone	(Not applicable to thin clones) Remove the LUN from the consistency group.
-sched	Type the ID of the schedule to apply to the LUN. View protection schedules on page 90 explains how to view the IDs of the schedules on the system.
-schedPaused	Pause the schedule specified for the -sched qualifier. Valid values are: <ul style="list-style-type: none"> • yes • no
-noSched	Unassigns the protection schedule.
-spOwner	(Not applicable to thin clones) Specify the default owner of the LUN. Valid values are: <ul style="list-style-type: none"> • spa • spb

Qualifier	Description
-fastvpPolicy	<p>(Not applicable to thin clones) Specify the FAST VP tiering policy for the LUN. This policy defines both the initial tier placement and the ongoing automated tiering of data during data relocation operations. Valid values (case-insensitive):</p> <ul style="list-style-type: none"> • startHighThenAuto (default)—Sets the initial data placement to the highest-performing drives with available space, and then relocates portions of the storage resource's data based on I/O activity. • auto—Sets the initial data placement to an optimum, system-determined setting, and then relocates portions of the storage resource's data based on the storage resource's performance statistics such that data is relocated among tiers according to I/O activity. • highest—Sets the initial data placement and subsequent data relocation (if applicable) to the highest-performing drives with available space. • lowest—Sets the initial data placement and subsequent data relocation (if applicable) to the most cost-effective drives with available space.
-lunHosts	<p>Specify a comma-separated list of hosts with access to the LUN.</p> <p>i NOTE: This list must include all of the hosts you currently want to have access to the LUN. When adding new host access, include the list of existing hosts in the comma-separated list, and add the new hosts that you want. When removing access for hosts, include the list of existing hosts in the comma-separated list, and exclude the hosts that you want to remove from the list.</p>
-hlus	<p>Specifies the comma-separated list of Host LUN identifiers to be used by the corresponding hosts which were specified in the -lunHosts option. The number of items in the two lists must match. However, an empty string is a valid value for any element of the Host LUN identifiers list, as long as commas separate the list elements. Such an empty element signifies that the system should automatically assign the Host LUN identifier value by which the corresponding host will access the LUN.</p> <p>If not specified, the system will automatically assign the Host LUN identifier value for every host specified in the -lunHosts argument list.</p>
-snapHosts	Specify a comma-separated list of hosts with access to snapshots of the LUN.
-replDest	<p>Specifies whether the resource is a replication destination. Valid values are:</p> <ul style="list-style-type: none"> • yes • no <p>i NOTE: This value must be no for a thin clone.</p>
-ioLimit	Specify the name of the host I/O limit policy to be applied.
-noIoLimit	Specify the removal of an applied host I/O limit policy.
-dataReduction	<p>(Not applicable to thin clones) Specify whether data reduction is enabled for the LUN. Valid values are:</p> <ul style="list-style-type: none"> • yes • no <p>i NOTE: Data reduction is available for thin LUNs in an All-Flash pool only.</p>
-advancedDedup	<p>Specify whether advanced deduplication is enabled for this LUN. This option is available only after data reduction has been enabled. An empty value indicates that advanced deduplication is not supported on the LUN. Valid values are:</p> <ul style="list-style-type: none"> • yes • no (default) <p>i NOTE: Advanced deduplication is available only on:</p> <ul style="list-style-type: none"> • Dynamic or Traditional pools in Unity 380F, 480F, 680F, and 880F systems • Dynamic pools in Unity All-Flash 450F, 550F, and 650F systems • All-Flash pools in Unity Hybrid 380, 480, 680, and 880 systems

Example 1

The following command updates LUN lun_1 with these settings:

- Name is NewName.
- Description is "My new description."
- Primary storage size is 150 MB.

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /stor/prov/luns/lun -id lun_1 set -name NewName -descr "My new description" -size 150M
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

ID = lun_1
Operation completed successfully.
```

Example 2

The following command adds access for two new hosts to LUN lun_2 in addition to it's existing hosts:

- host13
- host14


```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /stor/prov/luns/lun -id lun_2 set -lunHosts host1, host2, host11, host13, host14
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

ID = lun_2
Operation completed successfully.
```

Delete LUNs

Delete a LUN.

 **NOTE:** Deleting a LUN removes all associated data from the system. After a LUN is deleted, you cannot restore the data inside it from snapshots. Back up the data from a LUN to another host before deleting it from the system.

Format

```
/stor/prov/luns/lun {-id <value> | -name <value>} delete [-deleteSnapshots {yes | no}] [-async]
```

Object qualifiers

Qualifier	Description
-id	Type the ID of the LUN to delete.
-name	Type the name of the LUN to delete.

Action qualifiers

Qualifier	Description
-deleteSnapshots	Specify that snapshots of the LUN can be deleted along with the LUN itself. Valid values are: <ul style="list-style-type: none"> • yes • no (default)
-async	Run the operation in asynchronous mode.

Example

The following command deletes LUN lun_1:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /stor/prov/luns/lun -id lun_1 delete
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

Operation completed successfully.
```

Refresh thin clones of a LUN

(Applies to thin clones only) Refresh a LUN's thin clone. This updates the thin clone's data with data from the specified source snapshot and re-parents the thin clone to that snapshot.

Format

```
/stor/prov/luns/lun {-id <value> | -name <value>} refresh [-async] {-source <value> | -sourceName <value>} [-copyName <value>] [-force]
```

Object qualifiers

Qualifier	Description
-id	Type the ID of the thin clone to refresh.
-name	Type the name of the thin clone to refresh.

Action qualifiers

Qualifier	Description
-async	Run the operation in asynchronous mode.
-source	Specify the ID of the snapshot to be used for the thin clone refresh. The snapshot must be part of the base LUN family.
-sourceName	Specify the name of the snapshot to be used for the thin clone refresh. The snapshot must be part of the base LUN family.
-copyName	Specify the name of the copy to be created before the thin clone refresh.
-force	Specify to unconditionally refresh the LUN, even if it has host access configured.

Example

The following command refreshes the thin clone called lun_5_tc with data from snapshot SNAP_2.

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /stor/prov/luns/lun -id lun_5_tc refresh -source SNAP_2 -copyName Backup1
```

```
[Response]
Storage system address: 10.64.75.201
Storage system port: 443
HTTPS connection

ID = 38654705846
Operation completed successfully.
```


Manage consistency groups

Consistency groups provide a way to organize and group LUNs together to simplify storage tiering and snapshots when an application spans multiple LUNs.

The following table lists the attributes for consistency groups:

Table 111. Consistency group attributes

Attribute	Description
ID	ID of the consistency group.
Name	Name of the consistency group.
Description	Brief description of the consistency group.
Type	Type of consistency group. Value is one of the following (case insensitive): <ul style="list-style-type: none">• Primary• Thin clone (tc when used with the <code>-create</code> command.)
Base storage resource	(Applies to thin clones only) ID of the base consistency group for the thin clone.
Source	(Applies to thin clones only) ID of the source snapshot for the thin clone.
Original parent	(Applies to thin clones only) ID of the parent consistency group for the thin clone.
Health state	Health state of the consistency group. The health state code appears in parentheses. Value is one of the following: <ul style="list-style-type: none">• OK (5) —The resource is operating normally.• Degraded/Warning (10) —Working, but one or more of the following may have occurred:<ul style="list-style-type: none">◦ One or more of its storage pools are degraded.◦ Resource is degraded.◦ Resource is running out of space and needs to be increased.• Minor failure (15) —One or both of the following may have occurred:<ul style="list-style-type: none">◦ One or more of its storage pools have failed.◦ Resource is unavailable.• Major failure (20) —One or both of the following may have occurred:<ul style="list-style-type: none">◦ One or more of its storage pools have failed.◦ Resource is unavailable.• Critical failure (25) —One or more of the following may have occurred:<ul style="list-style-type: none">◦ One or more of its storage pools are unavailable.◦ Resource is unavailable.◦ Resource has run out of space and needs to be increased.• Non-recoverable error (30) —One or both of the following may have occurred:<ul style="list-style-type: none">◦ One or more of its storage pools are unavailable.◦ Resource is unavailable.
Health details	Additional health information. See Appendix A, Reference, for health information details.
Total capacity	Total capacity of all associated LUNs.
Total current allocation	Total current allocation of all associated LUNs.
Total pool space preallocated	Space reserved from the pool by all associated LUNs for future needs to make writes more efficient. Equal to the sum of all the <code>sizePreallocated</code> values of each LUN in the group. The pool may be able to reclaim some of this space if pool space is running low.
Total pool space used	Total pool space used in the pool for all the associated LUNs, their snapshots or thin clones, and overhead.
Thin provisioning enabled	Identifies 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

Table 111. Consistency group attributes (continued)






Attribute	Description
	<p>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.</p> <p> NOTE: The Unisphere online help provides more details on thin provisioning.</p>
Data Reduction enabled	<p>Identifies whether data reduction is enabled. Valid values are:</p> <ul style="list-style-type: none"> • yes • no • mixed—Indicates that some of the LUNs in the consistency group have data reduction enabled, while some LUNs do not have data reduction enabled. <p> NOTE: Data reduction is available for thin LUNs in an All-Flash pool only.</p>
Advanced deduplication enabled	<p>Identifies whether advanced deduplication is enabled. This option is available only after data reduction has been enabled. An empty value indicates that advanced deduplication is not supported for the LUN in the consistency group. Valid values are:</p> <ul style="list-style-type: none"> • yes • no (default) <p> NOTE: Advanced deduplication is available only on:</p> <ul style="list-style-type: none"> • Dynamic or Traditional pools in Unity 380F, 480F, 680F, and 880F systems • Dynamic pools in Unity All-Flash 450F, 550F, and 650F systems • All-Flash pools in Unity Hybrid 380, 480, 680, and 880 systems
Total non-base size used	(Applies to standard consistency groups only) Quantity of storage used for the snapshots and thin clones associated with this consistency group.
Total family size used	(Applies to standard consistency groups only) Quantity of storage used for the whole consistency group family.
Snapshot count	Number of snapshots created on the resource.
Family snapshot count	(Applies to standard consistency groups only) Number of snapshots created in the consistency group family, including all derivative snapshots.
Family thin clone count	(Applies to standard consistency groups only) Number of thin clones created in the consistency group family, including all derivative thin clones.
Protection schedule	ID of a protection schedule applied to the consistency group. View protection schedules on page 90 explains how to view the IDs of the schedules on the system.
Protection schedule paused	Identifies whether an applied protection schedule is currently paused.
LUN access hosts	<p>List of hosts with access permissions to the associated LUNs.</p> <p> NOTE: Hosts that have access to the snapshots of some, but not all of the associated LUNs are marked as Mixed.</p>
Snapshots access hosts	<p>List of hosts with access to snapshots of the associated LUNs.</p> <p> NOTE: Hosts that have access to the snapshots of some, but not all of the associated LUNs are marked as Mixed.</p>
Replication destination	<p>Identifies whether the storage resource is a destination for a replication session (local or remote). Valid values are:</p> <ul style="list-style-type: none"> • yes • no
Creation time	Time the consistency group was created.
Last modified time	Time the consistency group was last modified.

Table 111. Consistency group attributes (continued)

Attribute	Description
FAST VP policy	<p>FAST VP tiering policy for the consistency group. This policy defines both the initial tier placement and the ongoing automated tiering of data during data relocation operations for each LUN in the consistency group. Valid values (case-insensitive):</p> <ul style="list-style-type: none"> • <code>startHighThenAuto</code> (default)—Sets the initial data placement to the highest-performing drives with available space, and then relocates portions of the storage resource's data based on I/O activity. • <code>auto</code>—Sets the initial data placement to an optimum, system-determined setting, and then relocates portions of the storage resource's data based on the storage resource's performance statistics such that data is relocated among tiers according to I/O activity. • <code>highest</code>—Sets the initial data placement and subsequent data relocation (if applicable) to the highest-performing drives with available space. • <code>lowest</code>—Sets the initial data placement and subsequent data relocation (if applicable) to the most cost-effective drives with available space. • <code>Mixed</code>—Value when the LUNs in the consistency group use different FAST VP policies.
FAST VP distribution	<p>Percentage of the resource assigned to each tier. The format is:</p> <pre><tier_name>:<value>%</pre> <p>where:</p> <ul style="list-style-type: none"> • <code><tier_name></code> is the name of the storage tier. • <code><value></code> is the percentage of storage in that tier.


Create a consistency group

Create a consistency group.

Format

```
/stor/prov/luns/group create [-async] -name <value> [-descr <value>] [-type {primary | tc  
{ -source <value> | -sourceName <value> } }] [-sched <value> [-schedPaused {yes | no}]]  
[-replDest {yes | no}]
```

Action qualifiers

Qualifier	Description
<code>-async</code>	Run the operation in asynchronous mode.
<code>-name</code>	<p>Type the name of the consistency group.</p> <p> NOTE: 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.</p>
<code>-descr</code>	Type a brief description of the consistency group.
<code>-type</code>	<p>Specify the type of consistency group. Valid values are (case insensitive):</p> <ul style="list-style-type: none"> • <code>primary</code> (default) • <code>tc</code>
<code>-source</code>	(Applies to thin clones only) Specify the ID of the source snapshot to use for thin clone creation.
<code>-sourceName</code>	(Applies to thin clones only) Specify the name of the source snapshot to use for thin clone creation.
<code>-sched</code>	Type the ID of a protection schedule to apply to the consistency group. View protection schedules on page 90 explains how to view the IDs of the schedules on the system.

Qualifier	Description
-schedPaused	Specify whether to pause the protection schedule specified for -sched. Valid values are: <ul style="list-style-type: none"> • yes • no (default)
-replDest	(Not applicable when creating a thin clone) Specifies whether the resource is a replication destination. Valid values are: <ul style="list-style-type: none"> • yes • no (default)

Example

The following command creates a consistency group with these settings:

- Name is GenericStorage01.
- Description is "MyStorage."
- Uses protection schedule SCHD_1.

The storage resource receives the ID group_1:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /stor/prov/luns/group create -name GenericStorage01 -descr "MyStorage" -sched SCHD_1
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection
```

```
ID = group_1
Operation completed successfully.
```

Example 2

The following command creates a thin clone with these settings:

- Name is MyFC.
- Source is SNAP_1.

The storage resource receives the ID group_2:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /stor/prov/luns/group create name "MyFC" -descr "My FC" -type tc -sourceName SNAP_1
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection
```

```
ID = group_1
Operation completed successfully.
```

View consistency groups

Display the list of existing consistency groups.

Format

```
group [{-id <value> | -name <value> | -type {primary | tc [{-originalParent <value> | -originalParentName <value> | -source <value> | -sourceName <value> | -baseRes <value> | -baseResName <value>}}]}] show
```

Object qualifiers

Qualifier	Description
-id	Type the ID of a consistency group.
-name	Type the name of a consistency group.
-type	Identifies the type of resources to display. Valid values are (case insensitive): <ul style="list-style-type: none">• primary• tc
-originalParent	(Applies to thin clones only) Type the ID of a parent consistency group by which to filter thin clones.
-originalParentName	(Applies to thin clones only) Type the name of a parent consistency group by which to filter thin clones.
-source	(Applies to thin clones only) Type the ID of a source snapshot by which to filter thin clones.
-sourceName	(Applies to thin clones only) Type the name of a source snapshot by which to filter thin clones.
-baseRes	(Applies to thin clones only) Type the ID of a base consistency group by which to filter thin clones.
-baseResName	(Applies to thin clones only) Type the name of a base consistency group by which to filter thin clones.

Example

The following command display details about the consistency groups and thin clones on the system:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /stor/prov/luns/group show -detail
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

1:      ID              = group_1
      Name              = MyLUNGroup
      Description       = My Consistency group
      Type              = Primary
      Base storage resource =
      Source            =
      Original parent    =
      Health state       = OK (5)
      Health details     = "The component is operating normally. No
action  is required."
      Total capacity     = 107374182400 (100G)
      Thin provisioning enabled = no
      Total current allocation = 107374182400 (100G)
      Total pool space preallocated = 4292853760 (3.9G)
      Total Pool Space Used = 9128919040 (8.5G)
      Total protection size used = 0
      Snapshot count     = 0
      Compression enabled = yes
      Data Reduction enabled = yes
      Advanced deduplication enabled = yes
      Total current allocation = 10737418240 (10G)
      Protection schedule = SCHD_1
      Protection schedule paused = no
      LUNs access hosts   = 1014, 1015
      Snapshots access hosts = 1016(mixed)
      Replication destination = no
      Creation time       = 2012-12-21 12:55:32
      Last modified time  = 2013-01-15 10:31:56
      FAST VP policy      = mixed
      FAST VP distribution = Best Performance: 55%, High Performance:
10%, High Capacity: 35%
```

```

2:      ID                = group_2
      Name                = MyLUNGroupFC
      Description          = My Consistency group
      Type                = Thin clone
      Base storage resource = group_1
      Source              = snap_1
      Original parent      = group_1
      Health state         = OK (5)
      Health details       = "The component is operating normally.  No
action is required."
      Total capacity       = 107374182400 (100G)
      Thin provisioning enabled = yes
      Total current allocation =
      Total pool space preallocated =
      Total Pool Space Used =
      Total protection size used =
      Total non-base size used = 0
      Total family size used = 0
      Snapshot count       = 0
      Compression enabled  = no
      Data Reduction enabled = no
      Advanced deduplication enabled = no
      Protection schedule  = SCHD_1
      Protection schedule paused = no
      LUNs access hosts    = 1014, 1015
      Snapshots access hosts =
      Replication destination = no
      Creation time        = 2012-12-21 12:55:32
      Last modified time    = 2013-01-15 10:31:56
      FAST VP policy       = mixed
      FAST VP distribution =

```

Change consistency groups

Change the settings for a consistency group.

Format

```

/stor/prov/luns/group {-id <value> | -name <value>} set [-async] [-name <value>] [-descr
<value>] [{-sched <value> | -noSched}] [-schedPaused {yes | no}] [-lunHosts <value>]
[-snapHosts <value>] [-replDest {yes | no}] [-fastvpPolicy {startHighThenAuto | auto |
highest | lowest | none}] [-dataReduction {yes [-advancedDedup {yes | no}] | no} ]




```

Object qualifiers

Qualifier	Description
-id	Type the ID of the consistency group to change.
-name	Type the name of the consistency group to change.

Action qualifier

Qualifier	Description
-async	Run the operation in asynchronous mode.
-name	Type the name of the consistency group.
-descr	Type a brief description of the consistency group.
-sched	Type the ID of the schedule to apply to the consistency group. View protection schedules on page 90 explains how to view the IDs of the schedules on the system.

Qualifier	Description
-schedPaused	<p>Pause the schedule specified for the -sched qualifier. Valid values are:</p> <ul style="list-style-type: none"> • yes • no (default)
-noSched	Unassign the protection schedule.
-lunHosts	Specify a comma-separated list of hosts with access to the LUN.
-snapHosts	Specify a comma-separated list of hosts with access to snapshots of the LUN.
-replDest	<p>Specify whether the resource is a replication destination. Valid values are:</p> <ul style="list-style-type: none"> • yes • no (default) <p> NOTE: This value must be no for a thin clone.</p>
-fastvpPolicy	<p>(Cannot be changed for thin clones) Specify the FAST VP tiering policy for the consistency group. This policy defines both the initial tier placement and the ongoing automated tiering of data during data relocation operations. Valid values (case-insensitive):</p> <ul style="list-style-type: none"> • startHighThenAuto (default)—Sets the initial data placement to the highest-performing drives with available space, and then relocates portions of the storage resource's data based on I/O activity. • auto—Sets the initial data placement to an optimum, system-determined setting, and then relocates portions of the storage resource's data based on the storage resource's performance statistics such that data is relocated among tiers according to I/O activity. • highest—Sets the initial data placement and subsequent data relocation (if applicable) to the highest-performing drives with available space. • lowest—Sets the initial data placement and subsequent data relocation (if applicable) to the most cost-effective drives with available space.
-dataReduction	<p>(Cannot be changed for thin clones) Specify whether data reduction is enabled for LUNs in this consistency group. Valid values are:</p> <ul style="list-style-type: none"> • yes • no <p> NOTE: Data reduction is available for thin LUNs in an All-Flash pool only.</p>
-advancedDedup	<p>Specify whether advanced deduplication is enabled for LUNs in this consistency group. This option is available only after data reduction has been enabled. An empty value indicates that advanced deduplication is not supported for LUNs in this consistency group. Valid values are:</p> <ul style="list-style-type: none"> • yes • no (default) <p> NOTE: Advanced deduplication is available only on:</p> <ul style="list-style-type: none"> • Dynamic or Traditional pools in Unity 380F, 480F, 680F, and 880F systems • Dynamic pools in Unity All-Flash 450F, 550F, and 650F systems • All-Flash pools in Unity Hybrid 380, 480, 680, and 880 systems

Example

The following command updates the consistency group group_1 with these settings:

- Name is NewName.
- Description is "New description."
- Uses protection schedule SCHD_2.
- The selected schedule is currently paused.
- The FAST VP policy is start high then auto-tier.

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /stor/prov/luns/group -id group_1
set -name NewName -descr "New description" -sched SCHED_2 -schedPaused yes -fastvpPolicy
startHighThenAuto
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection
```

```
ID = group_1
Operation completed successfully.
```

Delete consistency groups

Delete a consistency group.

NOTE: Deleting a consistency group removes all LUNs and data associated with the consistency group from the system. After a consistency group is deleted, you cannot restore the data from snapshots. Back up the data from the consistency group before deleting it.

Format

```
/stor/prov/luns/group {-id <value> | -name <value> } delete -id <value> [-async]
```

Object qualifiers

Qualifier	Description
-id	Type the ID of the consistency group to delete.
-name	Type the name of the consistency group to delete.

Action qualifier

Qualifier	Description
-deleteSnapshots	Specify that snapshots of the LUN can be deleted along with the LUN itself. Valid values are: <ul style="list-style-type: none">yesno (default)
-async	Run the operation in asynchronous mode.

Example

The following command deletes LUN consistency group storage resource group_1:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /stor/prov/luns/group -id group_1 delete
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection
```

```
Operation completed successfully.
```

Refresh thin clones of a consistency group

(Applies to thin clones only) Refresh a consistency group's thin clone. This updates the thin clones' data with data from the specified source snapshot and re-parents the thin clone to that snapshot.

Format

```
/stor/prov/luns/group {-id <value> | -name <value>} refresh [-async] {-source <value> | -sourceName <value>} [-copyName <value>] [-force]
```

Object qualifiers

Qualifier	Description
-id	Type the ID of the consistency group to refresh.
-name	Type the name of the consistency group to refresh.

Action qualifiers

Qualifier	Description
-async	Run the operation in asynchronous mode.
-source	Specify the ID of the snapshot to be used for thin clone refresh. The snapshot must be part of the base consistency group family.
-sourceName	Specify the name of the snapshot to be used for thin clone refresh. The snapshot must be part of the base consistency group family.
-copyName	Specify the name of the copy to be created before the thin clone refresh.
-force	Unconditionally refreshes the consistency group, even if the storage resource has host access configured.

Example

The following command refreshes the thin clone called group_2_tc with data from snapshot SNAP_10.

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /stor/prov/luns/group -id group_2_tc  
refresh -source SNAP_10 -copyName Backup1
```


```
Storage system address: 10.0.0.1  
Storage system port: 443  
HTTPS connection
```

```
ID = 38654705846  
Operation completed successfully.
```

Manage VMware NFS datastores

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.

 **NOTE:** You cannot create an NFS datastore on a NAS server that uses IP multi-tenancy.

The following table lists the attributes for NFS datastores:

Table 112. NFS datastore attributes

Attribute	Description
ID	ID of the NFS datastore.
Name	Name of the NFS datastore.

Table 112. NFS datastore attributes (continued)

Attribute	Description
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"> OK (5) —NFS datastore is operating normally. OK_BUT (7) —NFS datastore is working, but one or both of the following may have occurred: <ul style="list-style-type: none"> The storage resource is being initialized or deleted. The datastore on this storage resource is running out of space. Allocate more storage space to the storage resource. Degraded/Warning (10) —Working, but one or more of the following may have occurred: <ul style="list-style-type: none"> One or more of its storage pools are degraded. A replication session for the storage resource is degraded. It has almost reached full capacity. Increase the primary storage size, or create additional NFS datastores to store your data, to avoid data loss. Minor failure (15) —One or both of the following may have occurred: <ul style="list-style-type: none"> One or more of its storage pools have failed. The associated NAS server has failed. Major failure (20) —One or both of the following may have occurred: <ul style="list-style-type: none"> One or more of its storage pools have failed. NFS datastore is unavailable. Critical failure (25) —One or more of the following may have occurred: <ul style="list-style-type: none"> One or more of its storage pools are unavailable. NFS datastore is unavailable. NFS datastore has reached full capacity. Increase the primary storage size, or create additional NFS datastore to store your data, to avoid data loss. Non-recoverable error (30) —One or both of the following may have occurred: <ul style="list-style-type: none"> One or more of its storage pools are unavailable. NFS datastore is unavailable.
Health details	Additional health information. See Appendix A, Reference, for health information details.
File system	Identifier for the file system. The file system ID is displayed for some metrics commands. Use this ID to correlate metrics output with the associated NFS datastore.
Server	Name of the primary NAS server that the NFS datastore uses.
Storage pool ID	Identifier of the storage pool 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.
Host I/O size	<p>Typical write I/O size from the host to VMware datastore. This setting is used to match the storage block size to the I/O of the primary application using the VMware datastore, which can optimize IO performance. Host I/O size is only configurable at creation time. Valid values are:</p> <ul style="list-style-type: none"> 8K 16K 32K 64K Exchange 2007 (8K) Exchange 2010 (32K)

Table 112. NFS datastore attributes (continued)

Attribute	Description
	<ul style="list-style-type: none"> • Exchange 2013 (32K) • Oracle (8K) • SQL Server (8K) • VMware Horizon VDI (8K) • SharePoint (32K) • SAP (8K)
Thin provisioning enabled	<p>Identifies 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.</p> <p>NOTE: The Unisphere online help provides more details on thin provisioning.</p>
Data Reduction enabled	<p>Identifies whether data reduction is enabled for this resource. Valid values are:</p> <ul style="list-style-type: none"> • yes • no (default) <p>NOTE: Data reduction is available for thin file systems in an All-Flash pool only. The thin file systems must have been created on Unity systems running version 4.2.x or later.</p>
Data Reduction space saved	<p>Total space saved (in gigabytes) for this resource by using data reduction.</p> <p>NOTE: Data reduction is available for thin file systems in an All-Flash pool only. The thin file systems must have been created on Unity systems running version 4.2.x or later.</p>
Data Reduction percent	<p>Total percentage saved for the resource by using data reduction.</p> <p>NOTE: Data reduction is available for thin file systems in an All-Flash pool only. The thin file systems must have been created on Unity systems running version 4.2.x or later.</p>
Data Reduction ratio	<p>Ratio of the total storage used before data reduction and after data reduction for this resource.</p> <p>NOTE: Data reduction is available for thin file systems in an All-Flash pool only. The thin file systems must have been created on Unity systems running version 4.2.x or later.</p>
Advanced deduplication enabled	<p>Identifies whether advanced deduplication is enabled for this resource. This option is available only after data reduction has been enabled. An empty value indicates that advanced deduplication is not supported on the resource. Valid values are:</p> <ul style="list-style-type: none"> • yes • no (default) <p>NOTE: Advanced deduplication is available only on:</p> <ul style="list-style-type: none"> • Dynamic or Traditional pools in Unity 380F, 480F, 680F, and 880F systems • Dynamic pools in Unity All-Flash 450F, 550F, and 650F systems • All-Flash pools in Unity Hybrid 380, 480, 680, and 880 systems
Current allocation	If enabled, the quantity of primary storage currently allocated through thin provisioning.
Total pool space preallocated	Space reserved from the pool by the NFS datastore for future needs to make writes more efficient. The pool may be able to reclaim some of this space if it is unused by the NFS datastore and the pool is running low on space.
Total pool space used	Total space in the pool used by the NFS datastore.

Table 112. NFS datastore attributes (continued)

Attribute	Description
Minimum size allocated	(Displays for file systems created on a Unity system running OE version 4.1.) Indicates the minimum quantity of primary storage allocated to the NFS datastore through thin provisioning. File shrink operations cannot decrease the file system size lower than this value.
Protection size used	Quantity of storage currently used for protection data.
Snapshot count	Quantity of protection storage currently allocated through thin provisioning.
Protection schedule	ID of an applied protection schedule.
Protection schedule paused	Identifies whether an applied protection schedule is currently paused. Value is yes or no.
FAST VP policy	FAST VP tiering policy for the NFS datastore. This policy defines both the initial tier placement and the ongoing automated tiering of data during data relocation operations. Valid values (case-insensitive): <ul style="list-style-type: none"> startHighThenAuto (default)—Sets the initial data placement to the highest-performing drives with available space, and then relocates portions of the storage resource's data based on I/O activity. auto—Sets the initial data placement to an optimum, system-determined setting, and then relocates portions of the storage resource's data based on the storage resource's performance statistics such that data is relocated among tiers according to I/O activity. highest—Sets the initial data placement and subsequent data relocation (if applicable) to the highest-performing drives with available space. lowest—Sets the initial data placement and subsequent data relocation (if applicable) to the most cost-effective drives with available space.
FAST VP distribution	Percentage of the datastore assigned to each tier. The format is: <tier_name>:<value>% where: <ul style="list-style-type: none"> <tier_name> is the name of the storage tier. <value> is the percentage of storage in that tier.
Local path	Local path to be exported.
Export path	Export path to datastore.
Default access	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"> ro—Read-only access to primary storage and snapshots associated with the NFS datastore. rw—Read/write access to primary storage and snapshots associated with the NFS datastore. 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. na—No access to the NFS datastore or its snapshots.
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 and 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.
ESX mount protocol	Specifies which NFS protocol to use to register the datastore on the ESXi host. Valid values are: <ul style="list-style-type: none"> NFSv3 (default)

Table 112. NFS datastore attributes (continued)

Attribute	Description
	<ul style="list-style-type: none"> NFSv4
Minimum security	<p>The minimum security option that must be provided by a client in order to have a successful NFS mount operation. Valid values are:</p> <ul style="list-style-type: none"> <code>sys</code>—No server-side authentication (server relies on NFS client authentication). This is the default setting when there is no configured secure NFS for the NAS server. It is also the default when NFS Secure is enabled without NFSv4 for the NAS server. Also known as AUTH_SYS security. <code>krb5</code>—Kerberos v5 authentication. This is the default value when secure NFSv4 is configured for the NAS server
NFS owner username	Default owner of the NFS share associated with the datastore. For NFSv3 or NFSv4 protocols without Kerberos configured, the default owner is <code>root</code> .
Replication type	<p>Indicates in which asynchronous replication this file system is participating. Valid values are:</p> <ul style="list-style-type: none"> <code>none</code> <code>local</code> <code>remote</code>
Synchronous replication type	<p>Indicates in which synchronous replication this file system is participating. Valid values are:</p> <ul style="list-style-type: none"> <code>none</code> <code>remote</code>
Replication destination	<p>Identifies whether the storage resource is a destination for a replication session (local or remote). Valid values are:</p> <ul style="list-style-type: none"> <code>yes</code> <code>no</code>
Error Threshold	Identifies the threshold of used space in the storage resource as a percentage. When exceeded, error alert messages will be generated. The default value is 95%. If the threshold value is set to 0, this alert is disabled. This option must be set to a value greater than the Warning Threshold and Info Threshold.
Warning Threshold	Identifies the threshold of used space in the storage resource as a percentage. When exceeded, warning alert messages will be generated. The default value is 75%. If the threshold value is set to 0, this alert is disabled. This option must be set to a value less than the Error Threshold value, and greater than or equal to the Info Threshold value.
Info Threshold	Identifies the threshold of used space in the storage resource as a percentage. When exceeded, informational alert messages will be generated. The default value is 0 (disabled). This option must be set to a value less than the Warning Threshold value.
Creation time	The time the resource was created.
Last modified time	The time the resource was last modified.
Pool full policy	<p>Policy to follow when the pool is full and a write to the NFS datastore is attempted. This attribute enables you to preserve snapshots on the NFS datastore when a pool is full. Values are:</p> <ul style="list-style-type: none"> <code>Delete All Snaps</code> (default for thick file systems)—Delete snapshots associated with the NFS datastore when the pool reaches full capacity. <code>Fail Writes</code> (default for thin file systems)—Fail write operations to the NFS datastore when the pool reaches full capacity. <p>NOTE: This attribute is only available for existing NFS datastores. You cannot specify this attribute when creating an NFS datastore.</p>
Minimum size	The estimated minimum size that the file system can be shrunk to.
Reclaimable size	The estimated size reclaimed by the pool when the file system is shrunk to a specified size.

Table 112. NFS datastore attributes (continued)

Attribute	Description
Event publishing protocols	List of file system access protocols enabled for Events Publishing. By default, the list is empty. Valid value is <code>nfs</code> (enable Events Publishing for NFS).

Create NFS datastores

Create an NFS datastore.

Prerequisites



- Configure at least one storage pool for the NFS datastore to use and allocate at least one drive to the pool.
 - Configure at least one NAS server to which to associate the NFS datastore.
- i NOTE:** Share access permissions set for specific hosts take effect only if the host-specific setting is less restrictive than the default access setting for the share. Additionally, setting access for a specific host to “No Access” always takes effect over the default access setting.
- Example 1: If the default access setting for a share is Read-Only, setting the access for a specific host configuration to Read/Write will result in an effective host access of Read/Write.
 - Example 2: If the default access setting for the share is Read-Only, setting the access permission for a particular host configuration to No Access will take effect and prevent that host from accessing to the share.
 - Example 3: If the default access setting for a share is Read-Write, setting the access permission for a particular host configuration to Read-Only will result in an effective host access of Read/Write.


Format

```
/stor/prov/vmware/nfs create [-async] -name <value> [-replDest {yes|no}] [-descr <value>]
[-server <value> | -serverName <value>] {pool <value> | -poolName <value>} -size <value>
[-hostIOSize {8K | 16K | 32K | 64K | exchange2007 | exchange2010 | exchange2013 | oracle
| sqlServer | vmwareHorizon | sharePoint | sap}] [-thin {yes | no}] [-dataReduction {yes [-
advancedDedup {yes | no}] | no}] [-minSizeAllocated <value>] [-sched <value>] [-schedPaused
{yes | no}] [-defAccess {ro | root | na}] [-fastvpPolicy {startHighThenAuto | auto |
highest | lowest}] [-roHosts <value>] [-rwHosts <value>] [-rootHosts <value>] [-naHosts
<value>] [-esxMountProtocol {NFSv4 | NFSv3}] [-minSecurity {sys | krb5}] [-replDest {yes |
no}] [-nfsOwner <value>]] [-eventProtocols <value>]
```

Action qualifier

Qualifier	Description
<code>-async</code>	Run the operation in asynchronous mode.
<code>-name</code>	Type a name for the NFS datastore.
<code>-descr</code>	Type a brief description of the NFS datastore.
<code>-server</code>	Type the ID of the NAS server that will be the primary NAS server for the NFS datastore. i NOTE: NFS datastores cannot be created on a NAS server that uses IP multi-tenancy.
<code>-serverName</code>	Type the name of the NAS server that will be the primary NAS server for the NFS datastore. i NOTE: NFS datastores cannot be created on a NAS server that uses IP multi-tenancy.
<code>-pool</code>	Type the ID of the storage pool that the NFS datastore will use. This value has priority over the value for <code>-poolName</code> . i NOTE: Value is case-insensitive.

Qualifier	Description
-poolName	Type the name of the storage pool that the NFS datastore will use.
-size	Type the quantity of storage to reserve for the NFS datastore.
-hostIOSize	Type the typical write I/O size from the host to the NFS datastore. Valid values are: <ul style="list-style-type: none"> • 8K (default) — General purpose 8K • 16K — General purpose 16K • 32K — General purpose 32K • 64K — General purpose 64K • exchange2007 — 8K for Microsoft Exchange 2007 applications • exchange2010 — 32K for Microsoft Exchange 2010 applications • exchange2013 — 32K for Microsoft Exchange 2013 applications • oracle — 8K for Oracle database applications • sqlServer — 8K for Microsoft SQL Server applications • vmwareHorizon — 8K for VMware Horizon VDI applications • sharepoint — 32K for Microsoft SharePoint applications • sap — 8K for SAP applications
-thin	Enable thin provisioning on the NFS datastore. Valid values are: <ul style="list-style-type: none"> • yes • no (default)
-dataReduction	Specify whether data reduction is enabled for this thin NFS datastore. Valid values are: <ul style="list-style-type: none"> • yes • no (default) <p> NOTE: Data reduction is available for thin file systems in an All-Flash pool only. The thin file systems must have been created on Unity systems running version 4.2.x or later.</p>
-advancedDedup	Specify whether advanced deduplication is enabled for this thin NFS datastore. Valid values are: <ul style="list-style-type: none"> • yes • no (default) <p> NOTE: Thin file systems must be created on a Unity system running version 4.2.x or later. Advanced deduplication is available only on:</p> <ul style="list-style-type: none"> • Dynamic or Traditional pools in Unity 380F, 480F, 680F, and 880F systems • Dynamic pools in Unity All-Flash 450F, 550F, and 650F systems • All-Flash pools in Unity Hybrid 380, 480, 680, and 880 systems
-sched	Type the ID of a protection schedule to apply to the storage resource.
-minSizeAllocated	(Option available on a Unity system running OE version 4.1.) Specify the minimum size to allocate for the thin NFS datastore. Automatic and manual file shrink operations cannot decrease the file system size lower than this value. The default value is 3G, which is the minimum thin file system size.
-schedPaused	Specify whether to pause the protection schedule specified for -sched. Valid values are: <ul style="list-style-type: none"> • yes • no (default)
-fastvpPolicy	Specify the FAST VP tiering policy for the NFS datastore. This policy defines both the initial tier placement and the ongoing automated tiering of data during data relocation operations. Valid values (case-insensitive): <ul style="list-style-type: none"> • startHighThenAuto (default) — Sets the initial data placement to the highest-performing drives with available space, and then relocates portions of the storage resource's data based on I/O activity. • auto — Sets the initial data placement to an optimum, system-determined setting, and then relocates portions of the storage resource's data based on the storage resource's performance statistics such that data is relocated among tiers according to I/O activity. • highest — Sets the initial data placement and subsequent data relocation (if applicable) to the highest-performing drives with available space.

Qualifier	Description
	<ul style="list-style-type: none"> <code>lowest</code> — Sets the initial data placement and subsequent data relocation (if applicable) to the most cost-effective drives with available space.
<code>-defAccess</code>	<p>Specify the default share access settings for host configurations and for unconfigured hosts that can reach the NFS datastore. Valid values are:</p> <ul style="list-style-type: none"> <code>ro</code> — Read-only access to primary storage and snapshots associated with the NFS datastore. <code>root</code> — 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. <code>na</code> (default) — No access to the NFS datastore or its snapshots.
<code>-roHosts</code>	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. 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.
<code>-rwHosts</code>	Type the ID of each host you want to have read/write access to the datastore. This is only allowed if the NFSv4 ESXi mount protocol is enabled, and the NFS owner is set.
<code>-rootHosts</code>	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. 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.
<code>-naHosts</code>	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. 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.
<code>-esxMountProtocol</code>	<p>Type which NFS protocol version will be used to register the NFS datastore on the host. Valid values are:</p> <ul style="list-style-type: none"> <code>NFSv3</code> (default) <code>NFSv4</code>
<code>-nfsOwner</code>	<p>Type the default owner of the NFS share associated with the datastore. This must be specified if the minimum security is set to <code>krb5</code> and all hosts passed to the host access list are manually managed. If the passed hosts are all ESXi hosts, this value will be automatically configured to the NFS user configured on the ESXi host.</p> <p> NOTE: For NFSv3 or NFSv4 protocols configured without Kerberos, the default owner is <code>root</code>.</p>
<code>-minSecurity</code>	<p>Type the minimum security option that must be provided by the client in order to have a successful NFS mount operation. Valid values are (in order of lowest to highest security level):</p> <ul style="list-style-type: none"> <code>sys</code> — No server-side authentication (server relies on NFS client authentication). This is the default setting when there is no configured secure NFS for the NAS server. It is also the default when NFS Secure is enabled without NFSv4 for the NAS server. Also known as AUTH_SYS security. <code>krb5</code> — Kerberos v5 authentication. This is the default value when secure NFSv4 is configured for the NAS server
<code>-replDest</code>	<p>Specifies whether the resource is a replication destination. Valid values are:</p> <ul style="list-style-type: none"> <code>yes</code> <code>no</code> (default)
<code>-eventProtocols</code>	Specifies the comma-separated list of file system access protocols enabled for Events Publishing. By default, the list is empty. Valid value is <code>nfs</code> (enable Events Publishing for NFS).

Example

The following command creates an NFS datastore with these settings:

- Named "Accounting".
- Description is "Accounting VMs."
- Uses NAS server nas_1 as the primary NAS server.
- Uses the "capacity" storage pool.
- Primary storage size is 100 GB.
- Read-write access to host1
- Minimum security level of krb5.
- An NFS owner "John"
- Default host access as N/A

The file system 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 nas_1 -pool capacity -size 100G -rwHosts host1 -esxMountProtocol NFSv4 -minSecurity krb5 -nfsOwner john -defAccess na
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

ID = NFSDS_1
Operation completed successfully.
```


View NFS datastores

View details about an NFS datastore. You can filter on the NFS datastore ID or name.

Format

```
/stor/prov/vmware/nfs [ {-id <value> | -name <value>} [-shrinkToSize <value>]} show
```

Object qualifier

Qualifier	Description
-id	ID of the VMware NFS file system.
-name	Name of the VMware NFS file system.
-shrinkToSize	Specify the targeted shrink size to view an estimate of the minimum size and reclaimable size.  NOTE: Minimum size and reclaimable size are populated only when this qualifier is specified.

Example 1

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 -detail
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

1:      ID              = res_22
        Name            = NFSDatastore3
        Description      =
        Health state     = OK (5)
        Health details    = "The component is operating normally. No action
is required."
        File system       = fs_15
        Server            = nas_8
```

```

Storage pool ID          = pool_2
Storage pool             = Pool_2
Format                   = UFS64
Size                     = 1099511627776 (1.0T)
Size used                = 312623013888 (291.1G)
Maximum size             = 281474976710656 (256.0T)
Host I/O Size            = 8K
Thin provisioning enabled = yes
Compression enabled      = yes
Compression space saved  = 272193552384 (253.5G)
Compression percent      = 61%
Compression ratio        = 2.6:1
Data Reduction enabled   = yes
Data Reduction space saved = 272193552384 (253.5G)
Data Reduction percent   = 61%
Data Reduction ratio     = 2.6:1
Advanced deduplication enabled = no
Current allocation       = 116501004288 (108.5G)
Preallocated             = 176802226176 (164.6G)
Total Pool Space Used    = 174848221184 (162.8G)
Minimum size allocated   = 0
Protection size used     = 46267621376 (43.0G)
Snapshot count           = 4
Protection schedule      = snapSch_1
Protection schedule paused = no
Local path               = /
Export path              = 10.245.23.62:/NFSDatastore3
Default access           = root
Read-only hosts          =
Read/write hosts         =
Root hosts               = Host_1
No access hosts          =
ESX mount protocol       = NFSv3
Minimum security         = sys
NFS owner username       =
Error threshold          = 95%
Warning threshold        = 75%
Info threshold           = 10%
Replication type         = local
Synchronous replication type = none
Replication destination  = no
Deduplication enabled    =
Creation time            = 2018-08-30 18:38:44
Last modified time       = 2018-08-30 18:38:44
Minimum size             =
Reclaimable size         =
Pool Full policy         = Fail Writes
Event publishing protocols =

```

Example 2

The following command lists details about the vmware_1 NFS datastores with a shrink estimate:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /stor/prov/vmware/nfs -id vmware_1 -shrinkToSize 200G show
```

```

Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

1:      ID          = vmware_1
        Name        = MyVMware
        Description  = My VMware
        Health state = OK (5)
        File system  = fs_1
        Server       = SFServer00
        Storage pool ID = pool_1
        Storage pool   = capacity
        Format        = UFS64
        Size          = 536870912000 (500G)

```

```
Size used                = 128849018880 (120G)
Protection size used    = 0
Local path               = /
Export path              = 10.64.75.10/MyVMware
Minimum size             = 134217728000 (125G)
Reclaimable size        = 322122547200 (300G)
```

Change NFS datastore settings

Change the settings for an NFS datastore.



Format

```
/stor/prov/vmware/nfs {-id <value> | -name <value>} set [-async] -descr <value> -size
<value> [-minSizeAllocated <value>] [-dataReduction {yes [-advancedDedup {yes | no}} | no}}
[{-sched <value> | noSched} [-schedPaused {yes | no}}] [-fastvpPolicy {startHighThenAuto
| auto | highest | lowest}}] [-defAccess {ro | root | na}}] [-roHosts <value>] [-
rwHosts <value>] [-rootHosts <value>] [-naHosts <value>] [-esxMountProtocol {NFSv4 |
NFSv3}}] [-minSecurity {sys | krb5}}] [-replDest {yes | no}}] [-errorThreshold <value>]
[-warningThreshold <value>] [-infoThreshold <value>] [-poolFullPolicy {deleteAllSnaps |
failWrites}}] [-eventProtocols <value>]
```

Object qualifier

Qualifier	Description
-id	Type the ID of the NFS datastore to change.
-name	Type the name of the NFS datastore to change.

Action qualifier

Qualifier	Description
-async	Run the operation in asynchronous mode.
-descr	Type a brief description of the NFS datastore.
-size	Type the amount of storage in the pool to reserve for the NFS datastore.
-minSizeAllocated	(Option available on a Unity system running OE version 4.1.) Specify the minimum size to allocate for the thin NFS datastore. Automatic and manual file shrink operations cannot decrease the file system size lower than this value. The default value is 3G, which is the minimum thin file system size.
-dataReduction	Specify whether data reduction is enabled on the thin NFS datastore. Valid values are: <ul style="list-style-type: none">yesno <p> NOTE: Data reduction is available for thin file systems in an All-Flash pool only. The thin file systems must have been created on Unity systems running version 4.2.x or later.</p>
-advancedDedup	Specify whether advanced deduplication is enabled on the thin NFS datastore. Valid values are: <ul style="list-style-type: none">yesno <p> NOTE: Thin file systems must be created on a Unity system running version 4.2.x or later. Advanced deduplication is available only on:</p> <ul style="list-style-type: none">Dynamic or Traditional pools in Unity 380F, 480F, 680F, and 880F systemsDynamic pools in Unity All-Flash 450F, 550F, and 650F systemsAll-Flash pools in Unity Hybrid 380, 480, 680, and 880 systems

Qualifier	Description
<code>-sched</code>	Type the ID of the schedule to apply to the datastore.
<code>-noSched</code>	Unassigns the protection schedule.
<code>-fastvpPolicy</code>	Specify the FAST VP tiering policy for the NFS datastore. This policy defines both the initial tier placement and the ongoing automated tiering of data during data relocation operations. Valid values (case-insensitive): <ul style="list-style-type: none"> <code>startHighThenAuto</code> (default)—Sets the initial data placement to the highest-performing drives with available space, and then relocates portions of the storage resource's data based on I/O activity. <code>auto</code>—Sets the initial data placement to an optimum, system-determined setting, and then relocates portions of the storage resource's data based on the storage resource's performance statistics such that data is relocated among tiers according to I/O activity. <code>highest</code>—Sets the initial data placement and subsequent data relocation (if applicable) to the highest-performing drives with available space. <code>lowest</code>—Sets the initial data placement and subsequent data relocation (if applicable) to the most cost-effective drives with available space.
<code>-schedPaused</code>	Pause the schedule specified for the <code>-sched</code> qualifier. Valid values are: <ul style="list-style-type: none"> <code>yes</code> <code>no</code>
<code>-defAccess</code>	Specify the default share access settings for host configurations and for unconfigured hosts who can reach the datastore. Valid values are: <ul style="list-style-type: none"> <code>ro</code>—Read-only access to primary storage and snapshots associated with the datastore <code>root</code>—Read/write root access to primary storage and snapshots associated with the datastore. This includes the ability to set access controls that restrict the permissions for other login accounts. <code>na</code>—No access to the datastore or its snapshots.
<code>-roHosts</code>	Type the ID of each host configuration you want to grant read-only permission to the datastore and its snapshots. Separate each ID with a comma. For host configurations of type 'host,' by default, all of the host's IP addresses can access the 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. <code>-roHosts</code>
<code>-rwHosts</code>	Type the ID of each host you want to have read/write access to the datastore. This is only allowed if the NFSv4 ESXi mount protocol is enabled, and the NFS owner is set.
<code>-rootHosts</code>	Type the ID of each host configuration you want to grant root permission to the datastore and its snapshots. Separate each ID with a comma. For host configurations of type 'host,' by default, all of the host's IP addresses can access the 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.
<code>-naHosts</code>	Type the ID of each host configuration you want to block access to the datastore and its snapshots. Separate each ID with a comma. For host configurations of type 'host,' by default, all of the host's IP addresses cannot access the 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.
<code>-esxMountProtocol</code>	Type which NFS protocol version will be used to register the NFS datastore on the host. Valid values are: <ul style="list-style-type: none"> <code>NFSv3</code> (default) <code>NFSv4</code>
<code>-minSecurity</code>	Type the minimum security option that must be provided by the client in order to have a successful NFS mount operation. Valid values are (in order of lowest to highest security level): <ul style="list-style-type: none"> <code>sys</code>—No server-side authentication (server relies on NFS client authentication). This is the default setting when there is no configured secure NFS for the NAS server. It is also the default when NFS Secure is enabled without NFSv4 for the NAS server. Also known as AUTH_SYS security. <code>krb5</code>—Kerberos v5 authentication.

Qualifier	Description
-replDest	Specifies whether the resource is a replication destination. Valid values are: <ul style="list-style-type: none"> • yes • no
-errorThreshold	Specifies the threshold percentage that, when exceeded, error alert messages will be generated. The range is from 0 to 99, and the default value is 95%. If the threshold value is set to 0, this alert is disabled. This option must be set to a value greater than the -warningThreshold.
-warningThreshold	Specifies the threshold percentage that, when exceeded, warning alert messages will be generated. The range is from 0 to 99, and the default value is 75%. If the threshold value is set to 0, this alert is disabled. This option must be set to a value less than the -errorThreshold value, and greater than or equal to the -infoThreshold value.
-infoThreshold	Specifies the threshold percentage that, when exceeded, informational alert messages will be generated. The range is from 0 to 99, and the default value is 0 (disabled). This option must be set to a value less than the -warningThreshold value.
-poolFullPolicy	Specifies the policy to follow when the pool is full and a write to the NFS datastore is attempted. This attribute enables you to preserve snapshots on the NFS datastore when a pool is full. Values are: <ul style="list-style-type: none"> • deleteAllSnaps—Delete snapshots associated with the NFS datastore when the pool reaches full capacity. • failWrites—Fail write operations to the NFS datastore when the pool reaches full capacity.
-eventProtocols	Specifies the comma-separated list of file system access protocols enabled for Events Publishing. By default, the list is empty. Valid value is nfs (enable Events Publishing for NFS).

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"
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection
```

```
ID = NFSDS_1
Operation completed successfully.
```

Delete NFS datastores

Delete an NFS datastore.

 **NOTE:** Deleting a VMware 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> | -name <value>} delete [-deleteSnapshots {yes | no}] [-async]
```

Object qualifier

Qualifier	Description
-id	Type the ID of the VMware NFS datastore to delete.
-name	Type the name of the VMware NFS datastore to delete.

Action qualifier

Qualifier	Description
-deleteSnapshots	Specifies that the resource's snapshots should also be deleted. Valid values are: <ul style="list-style-type: none">• yes• no (default)
-async	Run the operation in asynchronous mode.

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
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

Operation completed successfully.
```

Manage VMware VMFS datastores

Virtual Machine File System (VMFS) datastores provide block storage for ESXi hosts. VMFS datastores appear to ESXi hosts as LUNs, to which the hosts connect through Fibre Channel (FC) or the iSCSI protocol. You can provision and manage VMFS datastores and view details about each VMFS datastore on the system, such as their storage capacity and health.

Table 113. VMFS datastore attributes

Attribute	Description
ID	ID of the VMFS datastore.
LUN	Logical unit number (LUN) ID of the VMFS datastore.
Name	Name of the VMFS datastore.
Description	Brief description of the VMFS datastore.
Type	Specifies the type of the VMFS datastore. Value is one of the following (case insensitive): <ul style="list-style-type: none">• Primary• Thin clone (tc when used with the <code>-create</code> command.)
Base storage resource	(Applies to thin clones only) ID of the base VMFS datastore for the thin clone.
Source	(Applies to thin clones only) ID of the source snapshot of the thin clone.
Original parent	(Applies to thin clones only) ID of the parent VMFS datastore for the thin clone.
Health state	Health state of the VMFS datastore. The health state code appears in parentheses. Value is one of the following:

Table 113. VMFS datastore attributes (continued)



Attribute	Description
	<ul style="list-style-type: none"> OK (5) —Datastore is operating normally. Degraded/Warning (10) —Working, but one or more of the following may have occurred: <ul style="list-style-type: none"> Its storage pool is degraded. Its replication session is degraded. Its replication session has faulted. It has almost reached full capacity. Increase the primary storage size, or create additional datastores to store your data, to avoid data loss. Minor failure (15) —One or both of the following may have occurred: <ul style="list-style-type: none"> Its storage pool has failed. The associated iSCSI node has failed. Major failure (20) —One or both of the following may have occurred: <ul style="list-style-type: none"> Datastore is unavailable. Its associated storage pool has failed. Critical failure (25) —One or more of the following may have occurred: <ul style="list-style-type: none"> Its storage pool is unavailable. Datastore is unavailable. Datastore has reached full capacity. Increase the primary storage size, or create additional file systems to store your data, to avoid data loss. Non-recoverable error (30) —One or both of the following may have occurred: <ul style="list-style-type: none"> Its storage pool is unavailable. Datastore is unavailable.
Health details	Additional health information. See Appendix A, Reference, for health information details.
Storage pool ID	ID of the storage pool the datastore uses.
Storage pool	Name of the storage pool the datastore uses.
Size	Quantity of storage reserved for primary data.
Maximum size	Maximum size to which you can increase the primary storage capacity.
AU size	<p>The size of the allocation unit in kilobytes. Valid values are:</p> <ul style="list-style-type: none"> 8 16 32 64
Thin provisioning enabled	<p>Identifies whether thin provisioning is enabled. Valid values are:</p> <ul style="list-style-type: none"> yes no (default) <p>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.</p> <p> NOTE: The Unisphere online help provides more details on thin provisioning.</p>
Data Reduction enabled	<p>Identifies whether data reduction is enabled. Valid values are:</p> <ul style="list-style-type: none"> yes no <p> NOTE: Data reduction is available for thin LUNs in an All-Flash pool only.</p>
Data Reduction space saved	Total space saved (in gigabytes) by using data reduction.

Table 113. VMFS datastore attributes (continued)





Attribute	Description
	 NOTE: Data reduction is available for thin LUNs in an All-Flash pool only.
Data Reduction percent	Total storage percentage saved by using data reduction.  NOTE: Data reduction is available for thin LUNs in an All-Flash pool only.
Data Reduction ratio	Ratio between data without data reduction and data after data reduction savings.  NOTE: Data reduction is available for thin LUNs in an All-Flash pool only.
Advanced deduplication enabled	Identifies whether advanced deduplication is enabled. This option is available only after data reduction has been enabled. An empty value indicates that advanced deduplication is not supported on the storage resource. Valid values are: <ul style="list-style-type: none"> • yes • no (default)  NOTE: Advanced deduplication is available only on: <ul style="list-style-type: none"> • Dynamic or Traditional pools in Unity 380F, 480F, 680F, and 880F systems • Dynamic pools in Unity All-Flash 450F, 550F, and 650F systems • All-Flash pools in Unity Hybrid 380, 480, 680, and 880 systems
Current allocation	If thin provisioning is enabled, the quantity of primary storage currently allocated through thin provisioning.
Total pool space preallocated	Space reserved from the pool by the VMFS datastore for future needs to make writes more efficient. The pool may reclaim some of this space if it is unused by the datastore and the pool is running low on space.
Total pool space used	Total space used from the pool by the VMFS datastore.
Non-base size used	(Applies to standard VMFS datastores only) Quantity of the storage used for the snapshots and thin clones associated with this datastore.
Family size used	(Applies to standard VMFS datastores only) Quantity of the storage used for the whole datastore family.
Snapshot count	Total number of snapshots on the VMFS datastore.
Family snapshot count	(Applies to standard VMFS datastores only) Number of snapshots on the datastore, including all derivative snapshots.
Family thin clone count	Number of thin clones created in the VMFS datastore family, including all derivative thin clones.
Protection schedule	ID of a protection schedule applied to the VMFS datastore .
Protection schedule paused	Indication of whether an applied protection schedule is currently paused.
SP owner	Indicates the default owner of the LUN. Valid values are: <ul style="list-style-type: none"> • SPA • SPB
Trespassed	Indicates whether the LUN is trespassed to the peer SP. Valid values are: <ul style="list-style-type: none"> • yes • no
LUN access hosts	List of hosts with access permissions to the VMFS datastore, presented to the hosts as a LUN.
Virtual disk access hosts	Comma-separated list of hosts with access to the associated disks.
Virtual disk host LUN IDs	Comma-separated list of HLUs (Host LUN identifiers) which the corresponding hosts use to access the virtual disks.
Snapshots access hosts	List of hosts with access permissions to the VMFS datastore snapshots.

Table 113. VMFS datastore attributes (continued)

Attribute	Description
WWN	World Wide Name of the VMware resource.
Replication destination	Indication of whether the storage resource is a destination for a replication session (local or remote). Valid values are: <ul style="list-style-type: none"> • yes • no
Creation time	The time the resource was created.
Last modified time	The time the resource was last modified.
FAST VP policy	FAST VP tiering policy for the VMFS datastore. This policy defines both the initial tier placement and the ongoing automated tiering of data during data relocation operations. Valid values (case-insensitive): <ul style="list-style-type: none"> • startHighThenAuto (default)—Sets the initial data placement to the highest-performing drives with available space, and then relocates portions of the storage resource's data based on I/O activity. • auto—Sets the initial data placement to an optimum, system-determined setting, and then relocates portions of the storage resource's data based on the storage resource's performance statistics such that data is relocated among tiers according to I/O activity. • highest—Sets the initial data placement and subsequent data relocation (if applicable) to the highest-performing drives with available space. • lowest—Sets the initial data placement and subsequent data relocation (if applicable) to the most cost-effective drives with available space.
FAST VP distribution	Percentage of the datastore assigned to each tier. The format is: <tier_name>:<value>% where: <ul style="list-style-type: none"> • <tier_name> is the name of the storage tier. • <value> is the percentage of storage in that tier.
Version	Indicates the VMFS version of the datastore. Valid values are: <ul style="list-style-type: none"> • 3 • 5 • 6
Block size	Indicates the block size in megabytes. Valid values are: <ul style="list-style-type: none"> • 1 • 2 • 4 • 8
IO limit	Indicates the identifier of the applied IO limit.
Effective maximum IOPS	The effective maximum IO per second for the VMFS datastore. For VMFS datastores with a density-based IO limit policy, this value is equal to the product of the Maximum IOPS and the Size of the attached VMFS datastore.
Effective maximum KBPS	The effective maximum KBs per second for the VMFS datastore. For VMFS datastores with a density-based IO limit policy, this value is equal to the product of the Maximum KBPS and the Size of the attached VMFS datastore.

Create VMware VMFS datastores

Create a VMFS datastore.



Prerequisites

- Configure at least one storage pool for the VMFS datastore to use and allocate at least one drive to the pool. Refer to the storage pools commands for how to create pools on the system automatically and for how to create custom pools.
- For iSCSI connections, configure at least one iSCSI interface for use by the VMFS datastore. No additional configuration is required in Unisphere for Fibre Channel connections to VMFS datastores.

Format

```
/stor/prov/vmware/vmfs create [-async] -name <value> [-descr <value>] [-type {primary | tc [-source <value> | -sourceName <value>}}] [{-pool <value> | -poolName <value>}] [-size <value>] [-thin {yes | no}] [-sched <value> [-schedPaused {yes | no}]] [-spOwner {spa | spb}] [-replDest {yes | no}] [-dataReduction {yes [-advancedDedup {yes | no}] | no}] [-fastvpPolicy {startHighThenAuto | auto | highest | lowest}] [-vdiskHosts <value>] [-hlus <value>] [-snapHosts <value>] [-version {3 -blockSize {1 | 2 | 4 | 8} | 5 | 6}] [-ioLimit <value>]
```

Action qualifiers

Qualifier	Description
-async	Run the operation in asynchronous mode.
-name	Type a name for the VMFS datastore.  NOTE: 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.
-type	Specify the type of VMFS datastore. Valid values are (case insensitive): <ul style="list-style-type: none">• primary (default)• tc
-source	(Applies to thin clones only) Specify the ID of the source snapshot to use for thin clone creation.
-sourceName	(Applies to thin clones only) Specify the name of the source snapshot to use for thin clone creation.
-pool	(Not applicable when creating a thin clone) Type the ID of the storage pool that the VMFS datastore will use.  NOTE: Value is case-insensitive.
-poolName	(Not applicable when creating a thin clone) Type the name of the storage pool that the VMFS datastore will use.
-size	(Not applicable when creating a thin clone) Type the quantity of storage to reserve for the VMFS datastore.
-thin	(Not applicable when creating a thin clone) Enable thin provisioning on the VMFS datastore. Valid values are: <ul style="list-style-type: none">• yes• no (default)
-sched	Type the ID of a protection schedule to apply to the storage resource.
-schedPaused	Specify whether to pause the protection schedule specified for the -sched parameter. Valid values are: <ul style="list-style-type: none">• yes• no
-spOwner	(Not applicable when creating a thin clone) Specify the default SP to which the VMware resource will belong. The storage system determines the default value. Valid values are: <ul style="list-style-type: none">• spa• spb

Qualifier	Description
-replDest	(Not applicable when creating a thin clone) Specifies whether the resource is a replication destination. Valid values are: <ul style="list-style-type: none"> • yes • no (default)
-dataReduction	(Not applicable when creating a thin clone) Specify whether to enable or disable data reduction for the VMFS datastore. Valid values are: <ul style="list-style-type: none"> • yes • no (default)
-advancedDedup	Specify whether to enable or disable advanced deduplication for the VMFS datastore. This option is available only after data reduction has been enabled. Valid values are: <ul style="list-style-type: none"> • yes • no (default) <p>i NOTE: Advanced deduplication is available only on:</p> <ul style="list-style-type: none"> • Dynamic or Traditional pools in Unity 380F, 480F, 680F, and 880F systems • Dynamic pools in Unity All-Flash 450F, 550F, and 650F systems • All-Flash pools in Unity Hybrid 380, 480, 680, and 880 systems
-fastvpPolicy	(Not applicable when creating a thin clone) Specify the FAST VP tiering policy for the VMFS datastore. This policy defines both the initial tier placement and the ongoing automated tiering of data during data relocation operations. Valid values (case-insensitive): <ul style="list-style-type: none"> • startHighThenAuto (default)—Sets the initial data placement to the highest-performing drives with available space, and then relocates portions of the storage resource's data based on I/O activity. • auto—Sets the initial data placement to an optimum, system-determined setting, and then relocates portions of the storage resource's data based on the storage resource's performance statistics such that data is relocated among tiers according to I/O activity. • highest—Sets the initial data placement and subsequent data relocation (if applicable) to the highest-performing drives with available space. • lowest—Sets the initial data placement and subsequent data relocation (if applicable) to the most cost-effective drives with available space.
-vdiskHosts	Type the ID of each host configuration to give access to the VMFS datastore. Separate each ID with a comma. 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.
-hlus	Specify the comma-separated list of Host LUN identifiers to be used by the corresponding hosts which were specified in the -vdiskHosts option. The number of items in the two lists must match. However, an empty string is a valid value for any element of the Host LUN identifiers list, as long as commas separate the list elements. Such an empty element signifies that the system should automatically assign the Host LUN identifier value by which the corresponding host will access the virtual disk.
-snapHosts	If this option is not specified, the system will automatically assign the Host LUN identifier value for every host specified in the -vdiskHosts argument list.
-version	Type the ID of each host configuration to give access to snapshots of the VMFS datastore. Separate each ID with a comma. 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.
-blockSize	Type the VMFS version of the datastore. Valid values are: <ul style="list-style-type: none"> • 3 • 5 (default) • 6
	Type the block size in megabytes of the datastore. Valid values are: <ul style="list-style-type: none"> • 1 • 2 • 4

Qualifier	Description
	<ul style="list-style-type: none"> 8 (default)
-ioLimit	Type the size of the I/O limit to be applied to the VMFS datastores.

Example

The following command creates a VMFS datastore with these settings:

- Name is Accounting3.
- Description is Accounting Group 3.
- Uses the capacity storage pool.
- Provides host access permissions to the VMFS datastore (presented as a LUN) to two of the IQNs for host configuration 1014 and for host configuration 1015.
- 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" -pool capacity -size 100G -thin yes -vdiskHosts
"1014,1015"
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

ID = VMFS_1
Operation completed successfully.
```

View VMware VMFS datastores

Display the list of existing VMFS datastores. You can filter on the ID of a VMFS datastore.

Format

```
/stor/prov/vmware/vmfs [{-id <value> | -name <value> | -type {primary | tc {-baseRes
<value> | -baseResName <value> | -originalParent <value> | -originalParentName <value> |
-source <value> | -sourceName <value>}}}] show
```

Object qualifier

Qualifier	Description
-id	Type the ID of a VMFS datastore.
-name	Type the name of a VMFS datastore.
-standalone	Displays only VMFS datastores that are not part of a consistency group.
-type	Identifies the type of resources to display. Valid values are (case insensitive): <ul style="list-style-type: none"> primary tc
-baseRes	(Applies to thin clones only) ID of the base VMFS datastore by which to filter thin clones.
-baseResName	(Applies to thin clones only) Name of the base VMFS datastore by which to filter thin clones.
-originalParent	(Applies to thin clones only) ID of the parent VMFS datastore by which to filter thin clones.
-originalParentName	(Applies to thin clones only) Name of the parent VMFS datastore by which to filter thin clones.

Qualifier	Description
-source	(Applies to thin clones only) ID of the source snapshot by which to filter thin clones.
-sourceName	(Applies to thin clones only) Name of the source snapshot by which to filter thin clones.

Example 1

The following command displays details about VMFS datastores and their thin clones :

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /stor/prov/vmware/vmfs show -detail
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

1:      ID                      = res_6
      LUN                      = sv_25
      Name                     = VMFS Datastore 1
      Description              =
      Type                     = Primary
      Base storage resource    = res_6
      Source                   =
      Original parent          =
      Health state             = OK (5)
      Health details           = "The component is operating normally. No action
is required."
      Storage pool ID          = pool_1
      Storage pool             = Pool_1
      Size                     = 1099511627776 (1.0T)
      Maximum size             = 70368744177664 (64.0T)
      Thin provisioning enabled = yes
      Compression enabled      = yes
      Compression space saved   = 267361714176 (249.0G)
      Compression percent      = 57%
      Compression ratio        = 2.3:1
      Data Reduction enabled    = yes
      Data Reduction space saved = 267361714176 (249.0G)
      Data Reduction percent    = 57%
      Data Reduction ratio     = 2.3:1
      Advanced deduplication enabled = no
      Current allocation        = 172823429120 (160.9G)
      Preallocated             = 82576048128 (76.9G)
      Total Pool Space Used     = 203844583424 (189.8G)
      Protection size used      = 20820606976 (19.3G)
      Non-base size used        = 20820606976 (19.3G)
      Family size used          = 203844583424 (189.8G)
      Snapshot count           = 2
      Family snapshot count     = 2
      Family thin clone count   = 0
      Protection schedule      = snapSch_1
      Protection schedule paused = no
      SP owner                  = SPB
      Trespassed               = no
      Version                   = 5
      Block size                = 1
      Virtual disk access hosts = Host_2
      Host LUN IDs              = 12
      Snapshots access hosts    =
      WWN                      = 60:06:01:60:09:00:43:00:CB:38:88:5B:BB:10:5B:09
      Replication destination   = no
      Creation time             = 2018-08-30 18:34:46
      Last modified time        = 2018-08-30 18:34:46
      IO limit                  =
      Effective maximum IOPS    = N/A
      Effective maximum KBPS    = N/A
```

Example 2

The following command displays details about the thin clones derived from the LUN named sv_2:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /stor/prov/vmware/vmfs -id vmware_2 show
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

      ID                  = vmware_2
      LUN                  = sv_2
      Name                  = MyFC
      Description           = My description
      Type                  = Thin clone
      Base storage resource = vmware_1
      Source                = snap_1
      Original parent       = vmware_1
      Health state          = OK (5)
      Storage pool ID       = pool_2
      Storage pool          = capacity
      Size                  = 107374182400 (100G)
      Protection size used  =
      Non-base size used    = 0
      SP owner              = SPA
      Trespassed            = no
```

Change VMware VMFS datastore settings

Change the settings for a VMFS datastore.


Format



```
/stor/prov/vmware/vmfs {-id <value> | -name <value>} set [-async] [-name <value>] [-descr <value>] [-size <value>] [{-sched <value> | -noSched}] [-schedPaused {yes | no}] [-spOwner {spa | spb}] [-replDest {yes | no}] [-dataReduction {yes [-advancedDedup {yes | no}] | no}] [-fastvpPolicy {startHighThenAuto | auto | highest | lowest}] [-vdiskHosts <value> [-hplus <value>]] [-snapHosts <value>] [{-ioLimit <value> | -noIoLimit}]
```

Object qualifier

Qualifier	Description
-id	Type the ID of the VMFS datastore to change.
-name	Type the name of the VMFS datastore to change.

Action qualifier

Qualifier	Description
-async	Run the operation in asynchronous mode.
-name	Type a name for the VMFS datastore.  NOTE: 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	(Not applicable to thin clones) Type the quantity of storage to allocate for the VMFS datastore.
-sched	Type the ID of a protection schedule to apply to the VMFS datastore.

Qualifier	Description
<code>-noSched</code>	Unassign the protection schedule.
<code>-schedPaused</code>	Specify whether to pause the protection schedule specified for <code>-sched</code> . Valid values are: <ul style="list-style-type: none"> • <code>yes</code> • <code>no</code>
<code>-spOwner</code>	(Not applicable to thin clones) Specify the default SP that owns the datastore. Valid values are: <ul style="list-style-type: none"> • <code>spa</code> • <code>spb</code>
<code>-replDest</code>	Specifies whether the resource is a replication destination. Valid values are: <ul style="list-style-type: none"> • <code>yes</code> • <code>no</code> <p> NOTE: This value must be <code>no</code> for a thin clone.</p>
<code>-dataReduction</code>	(Not applicable to thin clones) Specify whether to enable or disable data reduction for the VMFS datastore. Valid values are: <ul style="list-style-type: none"> • <code>yes</code> • <code>no</code>
<code>-advancedDedup</code>	Specify whether to enable or disable advanced deduplication for the VMFS datastore. Valid values are: <ul style="list-style-type: none"> • <code>yes</code> • <code>no</code> (default) <p> NOTE: Advanced deduplication is available only on:</p> <ul style="list-style-type: none"> • Dynamic or Traditional pools in Unity 380F, 480F, 680F, and 880F systems • Dynamic pools in Unity All-Flash 450F, 550F, and 650F systems • All-Flash pools in Unity Hybrid 380, 480, 680, and 880 systems
<code>-fastvpPolicy</code>	(Not applicable to thin clones) Specify the FAST VP tiering policy for the VMFS datastore. This policy defines both the initial tier placement and the ongoing automated tiering of data during data relocation operations. Valid values (case-insensitive): <ul style="list-style-type: none"> • <code>startHighThenAuto</code> (default) — Sets the initial data placement to the highest-performing drives with available space, and then relocates portions of the storage resource's data based on I/O activity. • <code>auto</code> — Sets the initial data placement to an optimum, system-determined setting, and then relocates portions of the storage resource's data based on the storage resource's performance statistics such that data is relocated among tiers according to I/O activity. • <code>highest</code> — Sets the initial data placement and subsequent data relocation (if applicable) to the highest-performing drives with available space. • <code>lowest</code> — Sets the initial data placement and subsequent data relocation (if applicable) to the most cost-effective drives with available space.
<code>-vdiskHosts</code>	Type the ID of each host configuration to give access to the VMFS datastore. Separate each ID with a comma. 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: <code>ID[IQN,IQN]</code> , where 'ID' is a host configuration ID and 'IQN' is an initiator IQN.
<code>-hlus</code>	Specify the comma-separated list of Host LUN identifiers to be used by the corresponding hosts which were specified in the <code>-vdiskHosts</code> option. The number of items in the two lists must match. However, an empty string is a valid value for any element of the Host LUN identifiers list, as long as commas separate the list elements. Such an empty element signifies that the system should automatically assign the Host LUN identifier value by which the corresponding host will access the virtual disk. If this option is not specified, the system will automatically assign the Host LUN identifier value for every host specified in the <code>-vdiskHosts</code> argument list.
<code>-snapHosts</code>	Type the ID of each host configuration to give access to snapshots of the VMFS datastore. Separate each ID with a comma. 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: <code>ID[IQN,IQN]</code> , where 'ID' is a host configuration ID and 'IQN' is an initiator IQN.

Qualifier	Description
-ioLimit	Type the size of the I/O limit to be applied.
-noIoLimit	Specifies that an existing I/O limit applied to the VMFS datastore will be removed.

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"
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection
```

```
ID = VMFS_1
Operation completed successfully.
```

Delete VMware VMFS datastores

Delete a VMFS datastore.

 **NOTE:** 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> | -name <value>} delete [-deleteSnapshots {yes | no}] [-async] delete [-deleteSnapshots {yes | no}] [-async]
```

Object qualifier

Qualifier	Description
-id	Type the ID of the VMFS datastore to delete.
-name	Type the name of the VMFS datastore to delete.

Action qualifier

Qualifier	Description
-async	Run the operation in asynchronous mode.
-deleteSnapshots	Specify whether the datastore can be deleted along with snapshots. Value is Yes or No (default).

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
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection
```


Operation completed successfully.

Refresh thin clones of a VMFS datastore

(Applies to thin clones only) Refresh the thin clone of a VMFS datastore. This updates the thin clone's data with data from the specified source snapshot.

Format

```
/stor/prov/vmware/vmfs {-id <value> | -name <value>} refresh [-async] {-source <value> | -sourceName <value>} -copyName <value> [-force]
```

Object qualifier

Qualifier	Description
-id	Type the ID of the VMFS datastore.
-name	Type the name of the VMFS datastore.

Action qualifier

Qualifier	Description
-async	Run the operation in asynchronous mode.
-source	Specify the ID of the snapshot to be used for the thin clone refresh. The snapshot must be part of the base VMFS datastore family.
-sourceName	Specify the name of the snapshot to be used for the thin clone refresh. The snapshot must be part of the base VMFS datastore family.
-copyName	Specify the name of the copy to be created before the thin clone refresh.
-force	Unconditionally refreshes the VMFS resource, even if the storage resource has host access configured.

Example

The following command refreshes the thin clone called vmware_2_tc with data from snapshot SNAP_2.

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /stor/prov/vmware/vmfs -id vmware_2_tc refresh -source SNAP_2 -copyName Backup1
```

```
[Response]
Storage system address: 10.64.75.201
Storage system port: 443
HTTPS connection

ID = 38654705846
Operation completed successfully.
```

Manage VMware protocol endpoints

Protocol Endpoints (PEs) are access points for ESX/ESXi host communication to the storage system. These endpoints establish a datapath on-demand for virtual machines and their respective VVol datastores. I/O from VMs is communicated through the PE to the VVol datastore on the storage system. A single protocol endpoint can multiplex I/O requests from a large number of VM clients to their virtual volumes.

NAS protocol endpoints are created and managed on the storage system and correspond to a specific NFS-based NAS server. It is recommended that you enable at least two NAS servers for VVols, one for each SP, for high availability. A File VVol will be bound to the associated NAS PE every time that VM is powered on. When the VM is powered off, VVols are unbound from the PE.

SCSI protocol endpoints correspond to a specific iSCSI interface or Fibre Channel connection. The Block VVol will be bound to the associated SCSI PE every time that the VM is powered on. When the VM is powered off, the PE is unbound. SCSI protocol endpoints are like LUN mount points that allow I/O access to VVols from the ESXi host to the storage system.

Table 114. Protocol endpoint attributes

Attribute	Description
ID	VMware protocol endpoint identifier.
Name	Protocol endpoint name.
Type	Type of protocol endpoint. Valid values are: <ul style="list-style-type: none"> SCSI NAS
VMware UUID	VMware UUID of the protocol endpoint.
Export path (NAS PEs only)	Export path to the PE.
IP address	IP address of the NAS server for File PEs.
WWN	The World Wide Name for Block PEs.
Default SP	Identifier for the preferred SP. Valid values are: <ul style="list-style-type: none"> SPA SPB
Current SP	Identifier for the current SP. Valid values are: <ul style="list-style-type: none"> SPA SPB
NAS server	Identifier of the associated NAS server for NAS PEs.
VMware NAS PE server (NAS PEs only)	ID of the corresponding VMware NAS PE server.
VVol datastore (NAS PEs only)	ID of the VVol datastore using the PE.
Host (SCSI PEs only)	Comma-separated list of identifiers for hosts that use the PE.
LUN ID	Logical Unit Number for the protocol endpoint on the host.
Health state	Health state.
Health details	Additional health information.

View protocol endpoints

Displays a list of existing protocol endpoints and their characteristics.

Format

```
/stor/prov/vmware/pe [-id <value>] show
```

Object qualifier

Qualifier	Description
-id	Type the ID of the protocol endpoint.

Example

The following example shows the detail for all protocol endpoints on the system.

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /stor/prov/vmware/pe show -detail
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

1:      ID                = rfc4122.60060160-ca30-3c00-962b-87806445241a
      Name                = scsi_pe_1
      Type                = SCSI
      VMware UUID         = rfc4122.60060160-ca30-3c00-962b-87806445241a
      Export path         =
      IP address          =
      WWN                 = 60:06:01:60:CA:30:3C:00:96:2B:87:80:64:45:24:1A
      Default SP          = SPA
      Current SP          = SPA
      NAS Server          =
      VMware NAS PE server =
      VVol datastore      =
      Host                = Host_1
      LUN ID              =
      Health state        = OK (5)
      Health details      = "The protocol endpoint is operating normally. No action is
required."
```

Change VMware protocol endpoint

Changes the settings for a VMware protocol endpoint. This command is applicable to SCSI protocol endpoints only.


Format

```
/stor/prov/vmware/pe -id <value> set [-async] -lunid <value>
```

Object qualifier

Qualifier	Description
-id	Type the ID of the protocol endpoint.

Action qualifier

Qualifier	Description
-async	Run the operation in asynchronous mode. <div> NOTE: Simultaneous commands, regardless of whether they are asynchronous, may fail if they conflict in trying to manage the same system elements.</div>
-lunid	Specify the new SCSI LUN ID for this protocol endpoint on the host.

Example

The following command changes the LUN used by the SCSI protocol endpoint.

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /stor/prov/vmware/pe set -id
rfc4122.d54a64e3-9511-4832-90c3-b2cdfb622a2c set -lunid 5
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection
```

```
ID = rfc4122.d54a64e3-9511-4832-90c3-b2cdfb622a2c
Operation completed successfully.
```

Manage VVol datastores

VVols reside in VVol datastores, also known as storage containers, which are comprised of storage allocations from one or more capability profiles. Capability profiles are built on top of one or more underlying storage pools. You can create VVol datastores based on one or more capability profiles and then allocate a specific amount of space from the capability profile to the VVol datastore.

Each VVol datastore has one or more capability profiles that describe its performance and capacity characteristics, such as drive type, FAST VP tiering policy, and space efficiency policy (thick or thin). These characteristics are derived based on the underlying storage pool. When a virtual volume is created in vSphere, it is assigned a storage policy profile. vSphere filters the compatible and incompatible available VVol datastores (from one or more storage systems) when the VVol is being created based on these profiles. Only VVol datastores that support the storage policy profile are considered compatible storage containers for deploying the VVol.

Table 115. VVol datastore attributes

Attribute	Description
ID	VVol datastore identifier.
Name	VVol datastore name.
Description	VVol datastore description.
VMware UUID	VWware UUID of the VVol datastore.
Type	Type of VVol datastore. Valid values are: <ul style="list-style-type: none"> File Block
Health state	Health state of the VVol datastore. Value is one of the following: <ul style="list-style-type: none"> Unknown (0) - Health is unknown. OK (5) - Operating normally. OK BUT (7) <ul style="list-style-type: none"> Storage resource allocation from one or more pools has exceeded the 85% threshold. Storage resource allocation from one or more pools has exceeded the 95% threshold. Degraded/Warning (10) <ul style="list-style-type: none"> Pool performance is degraded on one or more of the underlying storage pools for the virtual volume. Storage resource allocation from one or more pools has exceeded the 95% threshold, and the storage resource is oversubscribed. Major failure (20) <ul style="list-style-type: none"> The storage resource has failed due to one or more failed storage pools. The storage resource is unavailable due to one or more unavailable servers. The storage resource is unavailable and requires a Storage Integrity Check. Critical failure (25) - One or more of the underlying storage pools for a virtual volume is offline. Non-recoverable error (30) - Resource unavailable due to one or more unavailable storage pools.
Health details	Detailed health state for the VVol datastore.

Table 115. VVol datastore attributes (continued)

Attribute	Description
Capability profile	Comma-separated list of identifiers of capability profiles supported by the VVol datastore. Each identifier with a " (Not used) " suffix indicates that this profile can be removed from the VVol datastore.
Storage pool ID	Comma-separated list of identifiers of storage pools used for the VVol datastore.
Total capacity	Total capacity of the VVol datastore.
Total current allocation	Total current allocation of the VVol datastore in all associated storage pools.
Total used capacity	Total used capacity of the VVol datastore.
Creation time	Time when the VVol datastore was created.
Hosts	Hosts that have access to the datastore.
Last modified time	Time when the VVol datastore was last modified.


Create VVol datastores

Create a datastore for VMware VVols.

Format

```
/stor/prov/vmware/vvolds create [-async] -name <value> [-descr <value>] -cp <value> -size <value> -type { block | file } [-hosts <value>]
```

Action qualifier

Qualifier	Description
-async	Run the operation in asynchronous mode.
-name	Type a name for the VVol datastore.  NOTE: The name may contain alphanumeric values, a hyphen, an underscore, and a period. It cannot start with hyphen or period, and cannot consist only of digits.
-descr	Type a brief description for the VVol datastore.
-cp	Specify the list of identifiers of capability profiles supported by the VVol datastore.
-size	Specify the list of allocation sizes. Specify one allocation for the amount of total space available for VVol provisioning on the VVol datastore for the specified capability profile. If there are multiple capability profiles, the list should include allocation size respective to each capability profile.
-type	Specify the VVol datastore type. Valid values are: <ul style="list-style-type: none"> • block • file
-hosts	Specify the comma-separated list of hosts that will have access to the VVol datastore. For a list of eligible hosts, refer to View host configurations on page 231.

Example

The following command creates a VVol datastore with these settings:

- A VVol datastore name of "Engineering department"
- Associates the "cp_1" and "cp_2" capability profiles with this VVol datastore

- Allocates 10 GBs and 12 GBs from capability profiles cp_1 and cp_2, respectively, to the VVol datastore
 - Grants access for "Host_1" and "Host_2" to the datastore
- ```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /stor/prov/vmware/vvolds create -name "Engineering department" -cp cp_1,cp_2 -size 10G,12G -type file -hosts "Host_1,Host_2"
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

ID = res_1
Operation completed successfully.
```

## View VVol datastores

Display a list of existing VVol datastores and their characteristics.

### Format

```
/stor/prov/vmware/vvolds [-id <value>] show
```

### Object qualifiers

| Qualifier | Description                        |
|-----------|------------------------------------|
| -id       | Type the ID of the VVol datastore. |

### Example

The following command displays a list of VVol datastores and their characteristics.

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /stor/prov/vmware/vvolds show -detail
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

1: ID = res_1
 Name = Performance
 Description =
 VMware UUID = 550e8400-e29b-41d4-a716-446655440000
 Type = Block
 Health state = OK (5)
 Health details = "The component is operating normally. No action is
required."
 Capability profile = cp_1, cp_2 (Not used)
 Storage pool = pool_1,pool_3
 Total capacity = 128849018880 (120G)
 Total current allocation = 12884901888 (12G)
 Total used capacity = 1073741824 (1G)
 Hosts = Host_1
 Creation time = 2015-12-21 12:55:32
 Last modified time = 2016-01-15 10:31:56

2: ID = res_2
 Name = engineering
 Description =
 VMware UUID = rfc4122.534e0655-f5a3-41d7-8124-9d53be5d0c0d
 Type = file
 Health state = OK (5)
 Health details = "The component is operating normally. No action is
required."
 Capability profile = cp_1, cp_2
 Storage pool = pool_1, pool_2
```

```
Total capacity = 644245094400 (600.0G)
Total current allocation = 0
Total used capacity = 0
Creation time = 2015-06-20 01:48:54
Last modified time = 2015-06-20 01:48:54
```

## Change VVol datastores

Modify an existing VVol datastore.




### Format

```
/stor/prov/vmware/vvolds -id <value> set [-async] [-name <value>] [-descr <value>] [{-addCp <value> -size <value> | -modifyCp <value> -size <value> | -removeCp <value>}] [-hosts <value> [-force]]
```

### Object qualifier

| Qualifier | Description                                       |
|-----------|---------------------------------------------------|
| -id       | Type the ID of the VVol datastore to be modified. |

### Action qualifier

| Qualifier | Description                                                                                                                                                                                                                                                                                                                                                       |
|-----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| -async    | Run the operation in asynchronous mode.                                                                                                                                                                                                                                                                                                                           |
| -name     | Type a name for the VVol datastore.<br> <b>NOTE:</b> The name may contain alphanumeric values, a hyphen, an underscore, and a period. It cannot start with hyphen or period, and cannot consist only of digits.                                                                |
| -descr    | Type a new description for the VVol datastore.                                                                                                                                                                                                                                                                                                                    |
| -addCp    | Type the list of identifiers of new capability profiles the VVol datastore will support.                                                                                                                                                                                                                                                                          |
| -modifyCp | Type the list of identifiers of capability profiles already supported by the VVol datastore and specify the new allocated sizes for each.                                                                                                                                                                                                                         |
| -size     | Specify the list of allocation sizes. Specify one allocation for the amount of total space available for VVol provisioning on the VVol datastore for the specified capability profile. If there are multiple capability profiles, the list should include allocation size respective to each capability profile.                                                  |
| -removeCp | Type the list of identifiers of capability profiles you would like to remove from the VVol datastore.<br> <b>NOTE:</b> This command can only be used on capability profiles that are not currently in use by existing virtual volumes.                                         |
| -hosts    | Type the list of comma-separated hosts that will have access to the VVol datastore.                                                                                                                                                                                                                                                                               |
| -force    | Type to unconditionally unbind all virtual volumes that are currently bound to a protocol endpoint associated with a particular host.<br> <b>NOTE:</b> If host access is changed or removed for a VVol datastore, the associated protocol endpoints are automatically unbound. |

### Example

The following command modifies the following settings of a VVol datastore:

- Changes the description of the VVol datastore to "My new description"

- Changes the name of the VVol datastore to "MyNewName"
- Associates the capability profile "cp\_1" with VVol datastore "res\_1"
- Allocates 10 GBs of space from the pool to capability profile "cp\_1"

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /stor/prov/vmware/vvolds -id res_1 set
-name MyNewName -descr "My new description" -addCp cp_1 -size 10G
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

ID = res_1
Operation completed successfully.
```

## Delete VVol datastores

Deletes specified VVol datastores and their associated virtual volumes.

### Format

```
/stor/prov/vmware/vvolds [-id <value>] delete [-async] [-force { yes | no}]
```

### Object qualifier

| Qualifier | Description                        |
|-----------|------------------------------------|
| -id       | Type the ID of the VVol datastore. |

### Action qualifier

| Qualifier | Description                                                                                                                                        |
|-----------|----------------------------------------------------------------------------------------------------------------------------------------------------|
| -force    | Delete the VVol datastore and any of its associated VVols. Valid values are: <ul style="list-style-type: none"> <li>• yes</li> <li>• no</li> </ul> |
| -async    | Run the operation in asynchronous mode.                                                                                                            |

### Example

The following command deletes VVol datastore res\_1 as well as its virtual volumes.

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /stor/prov/vmware/vvolds -id res_1 delete
-force yes
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

Operation completed successfully.
```

## Manage VVol datastore allocation

Manage the allocation of storage to VVol datastores.



**Table 116. VVol datastore allocation attributes**

| Attribute          | Description                                                                                                                                              |
|--------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------|
| ID                 | VVol datastore allocation identifier.                                                                                                                    |
| VVol datastore     | VVol datastore identifier.                                                                                                                               |
| Capability profile | Identifier of the associated capability profile.                                                                                                         |
| Storage pool       | Comma-separated list of identifiers of storage pools associated with the capability profile.                                                             |
| Size               | Amount of total space available for VVol provisioning for a particular capability profile on the VVol datastore.                                         |
| Current allocation | Quantity of primary storage currently allocated for the VVol datastore for VVols provisioned with a particular capability profile on the VVol datastore. |
| Size used          | Amount of space used by virtual volumes provisioned with a particular capability profile on the VVol datastore.                                          |
| Health state       | Health state of the VVol datastore allocation.                                                                                                           |
| Health details     | Additional health information.                                                                                                                           |

## View VVol datastore allocation details


Displays existing VVol datastore allocations.

### Format

```
/stor/prov/vmware/vvolds/alloc {-id <value> | -vvolds <value> [{-pool <value> | -cp <value>}]} show
```

### Object qualifier

| Qualifier | Description                                           |
|-----------|-------------------------------------------------------|
| -id       | Type the allocation identifier of the VVol datastore. |
| -vvolds   | Type the ID of the VVol datastore.                    |
| -pool     | Type the ID of the storage pool.                      |
| -cp       | Type the ID of the capability profile.                |

 **NOTE:** To obtain the ID of the VVol datastore and its associated pool and capability profile IDs, refer to [View VVol datastores](#) on page 414.

### Example

The following command shows the allocation details for the VVol datastore "vvol\_1" from pool "pool\_1", including associated capability profile IDs, current size of the storage pool, and current size allocated to the VVol datastore from the storage pool.

```
uemcli /stor/prov/vmware/vvolds/alloc -vvolds vvolds_1 -pool pool_1 show -detail
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

1: ID = cpa_1
 VVol datastore = res_1
 Capability profile = cp_1
 Storage pool = pool_1
```

```

Size = 128849018880 (120G)
Current allocation = 12884901888 (12G)
Size used = 1073741824 (1G)
Health state = OK (5)
Health details = "The component is operating normally. No action is required."

```

## Manage VVol objects

Virtual volumes are encapsulations of virtual machine files, virtual disks, and their derivatives. There are several types of VVol objects that correspond to an individual virtual volume, including a VMDK VVol (data VVol), Config VVol, Memory VVol, and Swap VVol.

**Table 117. Types of VVols**

|                  |                                                                                                                                      |
|------------------|--------------------------------------------------------------------------------------------------------------------------------------|
| VMDK (Data) VVol | The VMDK VVol, displayed as <b>Data</b> VVol in Unisphere, contains the vDisk file, or the hard disk drive, for the VM.              |
| Config VVol      | The <b>Config</b> VVol contains settings, configuration, and state information for the VM. This includes .vmx, nvram, and log files. |
| Memory VVol      | The <b>Memory</b> VVol contains a complete copy of the VM memory as part of a with-memory VM snapshot.                               |
| Swap VVol        | The <b>Swap</b> VVol is created when VMs are powered on and contain copies of the VM memory pages that are not retained in memory.   |

**Table 118. VVol attributes**

| Attribute          | Description                                                                                                                                                                  |
|--------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ID                 | Virtual volume identifier.                                                                                                                                                   |
| Name               | Virtual volume name.                                                                                                                                                         |
| Type               | Type of virtual volume. Valid values are: <ul style="list-style-type: none"> <li>• Data</li> <li>• Config</li> <li>• Memory</li> <li>• Swap</li> <li>• Other</li> </ul>      |
| Replica type       | Virtual volume replica type. Valid values are: <ul style="list-style-type: none"> <li>• Base</li> <li>• Prepared Snap</li> <li>• Ready Snap</li> <li>• Fast-Clone</li> </ul> |
| Parent             | Identifier of the base/parent virtual volume for the snap, prepared snap, or fast-clone.                                                                                     |
| Health state       | Health state of the virtual volume.                                                                                                                                          |
| Health details     | Additional health information for the virtual volume.                                                                                                                        |
| Datastore          | Identifier of the datastore associated with the virtual volume.                                                                                                              |
| Storage pool       | Identifier of the storage pool that contains the virtual volume.                                                                                                             |
| Capability profile | Identifier of the capability profile associated with the virtual volume.                                                                                                     |
| Policy profile     | Name of the VMware vSphere policy profile.                                                                                                                                   |
| Compliant          | Indicates whether the virtual volume is compliant with the VMware vSphere policy profile.                                                                                    |
| Size               | Size of the virtual volume.                                                                                                                                                  |

**Table 118. VVol attributes (continued)**

| Attribute          | Description                                                                                                                                                                                                                                                                                                                                                                                             |
|--------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Current allocation | Total current allocation of the virtual volume.                                                                                                                                                                                                                                                                                                                                                         |
| Bound to           | Comma-separated list of protocol endpoint identifiers to which the virtual volume is bound. An empty value indicates an unbound virtual volume.                                                                                                                                                                                                                                                         |
| Binding details    | Binding details of the protocol endpoint to which the virtual volume is bound. <ul style="list-style-type: none"> <li>For virtual volumes bound to NFS protocol endpoints, this displays the full NFS paths.</li> <li>For virtual volumes bound to iSCSI protocol endpoints, this displays the virtual volume iSCSI secondary ID.</li> <li>For unbound virtual volumes, this value is empty.</li> </ul> |
| Virtual machine    | Identifier of the virtual machine.                                                                                                                                                                                                                                                                                                                                                                      |
| VM hard disk       | Name of the associated VM hard disk.                                                                                                                                                                                                                                                                                                                                                                    |

## View VVol objects

Display a list of existing VVol datastores and their characteristics.

### Format

```
/stor/prov/vmware/vvol {[-id <value> | [-vm <value>] [-cp <value>] [-pool <value>] [-datastore <value>] [-pe <value>] [-parent <value>] [-bound] [-noncompliant] } show
```

### Object qualifier

| Qualifier     | Description                                                                                                            |
|---------------|------------------------------------------------------------------------------------------------------------------------|
| -id           | Type the ID of the virtual volume.                                                                                     |
| -vm           | Type the ID of the associated VM for the virtual volume.                                                               |
| -cp           | Type the ID of the capability profile associated with the virtual volume.                                              |
| -pool         | Type the ID of the storage pool that contains the virtual volume.                                                      |
| -datastore    | Type the ID of the associated VVol datastore.                                                                          |
| -pe           | Type the ID of the protocol endpoint for which you want to see bound virtual volumes.                                  |
| -parent       | Type the ID of the parent virtual volume.                                                                              |
| -bound        | Specify in order to display a list of only bound virtual volumes.                                                      |
| -noncompliant | Specify in order to display only a list of virtual volumes not compliant with their respective VMware policy profiles. |

## Example

The following example displays the details of all VVols for the VM with the ID VM\_1.

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /stor/prov/vmware/vvol -vm VM_1 show -detail
```

```
Storage system address: 10.64.75.201
Storage system port: 443
HTTPS connection

1: ID = rfc4122.de305d54-75b4-431b-adb2-eb6b9e546014
 Name = Hard disk 1
```

```

Type = Data
Replica type = Base
Parent =
Health state = OK (5)
Health details = "The component is operating normally. No action is required."
Datastore = res_1
Storage pool = pool_1
Capability profile = cp_1
Policy profile = VMware policy profile
Compliant = yes
Size = 1073741824 (1G)
Thin = yes
Current allocation = 107374182 (100M)
Bound to = NASPE_1
Binding details = 192.168.3.3:/vvol1
Virtual machine = VM_1
VM hard disk = VM Hard Disk 1

```

## Delete VVol objects

Deletes the specified existing VVol objects.

**NOTE:** Deletion of VVol objects must be exclusively confirmed by the user. The following confirmation message will display:

```

Virtual volume deletion will also unbind and delete associated snapshots and fast-
clones. Do you want to delete the virtual volume?
yes / no:

```

The default in silent mode is yes.

## Format

```
/stor/prov/vmware/vvol -id <value> delete [-async]
```

## Object qualifier

| Qualifier | Description                        |
|-----------|------------------------------------|
| -id       | Type the ID of the virtual volume. |

## Action qualifier

| Qualifier | Description                             |
|-----------|-----------------------------------------|
| -async    | Run the operation in asynchronous mode. |

## Example

The following command deletes the virtual volume with the ID naa.6006016005603c009370093e194fca3f.

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /stor/prov/vmware/vvol -id
naa.6006016005603c009370093e194fca3f delete
```

```

Virtual volume deletion will also unbind and delete associated snapshots and fast-
clones. Do you want to delete the virtual volume?
yes / no:
yes

```

```
Storage system address: 10.0.0.1
```

Storage system port: 443  
HTTPS connection

Operation completed successfully.

## Manage capability profiles

A capability profile is a group of storage capabilities that are applicable for VVol datastores. You must create one or more capability profiles before creating VVol datastores.

Capabilities are automatically derived from the underlying storage pool and are determined by the pool properties. Usage tags are assigned by the storage admin.

There are three ways to profile storage capabilities for a pool:

**Table 119. Storage capabilities**

| Capability name                                         | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|---------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Service level-based provisioning (physical deployments) | <p>Expected service level for the pool:</p> <ul style="list-style-type: none"><li>• Platinum<ul style="list-style-type: none"><li>◦ Single-tiered Flash pool</li></ul></li><li>• Gold<ul style="list-style-type: none"><li>◦ Multitiered pool with a mix of Flash and SAS drives</li><li>◦ Single-tiered pools with SAS RAID 10</li></ul></li><li>• Silver<ul style="list-style-type: none"><li>◦ Single-tiered pools with SAS RAID 5 or RAID 6</li><li>◦ Multitiered pools with a mix of SAS and NL-SAS</li></ul></li><li>• Bronze<ul style="list-style-type: none"><li>◦ Single-tiered pools with NL-SAS</li><li>◦ Multitiered pools with a mix of Flash and NL-SAS</li></ul></li></ul>                                                |
| Service level-based provisioning (virtual deployments)  | <p>Expected service level for a virtual pool:</p> <ul style="list-style-type: none"><li>• Gold<ul style="list-style-type: none"><li>◦ Multitiered pool with a mix of Extreme Performance and Performance tiers</li><li>◦ Single-tiered Extreme Performance pool</li></ul></li><li>• Silver<ul style="list-style-type: none"><li>◦ Multitiered pool with a mix of Extreme Performance, Performance, and Capacity tiers</li><li>◦ Multitiered pool with a mix of Performance and Capacity tiers</li><li>◦ Single-tiered Performance pool</li></ul></li><li>• Bronze<ul style="list-style-type: none"><li>◦ Multitiered pool with a mix of Extreme Performance and Capacity tiers</li><li>◦ Single-tiered Capacity pool</li></ul></li></ul> |
| Usage tags                                              | <p>Usage tags can be applied to capability profiles to designate them and their associated VVol datastores for a particular use. For example, a VVol datastore may be tagged for VVols and VMs that support a particular application. The virtualization administrator and storage administrator should collaborate to define these usage tags.</p>                                                                                                                                                                                                                                                                                                                                                                                      |
| Storage properties                                      | <p>Supported storage properties include:</p> <ul style="list-style-type: none"><li>• Drive type:<ul style="list-style-type: none"><li>◦ Extreme Performance [Flash]</li><li>◦ Performance [SAS]</li><li>◦ Capacity [NL-SAS]</li><li>◦ Multitier [mixed]</li><li>◦ Extreme Multitier [mixed with Flash]</li></ul></li><li>• RAID type (physical deployments only):</li></ul>                                                                                                                                                                                                                                                                                                                                                              |

**Table 119. Storage capabilities (continued)**

| Capability name | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|-----------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                 | <ul style="list-style-type: none"> <li>○ RAID5</li> <li>○ RAID6</li> <li>○ RAID10</li> <li>○ Mixed</li> <li>● FAST Cache (physical deployments only): <ul style="list-style-type: none"> <li>○ Enabled</li> <li>○ Disabled</li> </ul> </li> <li>● FAST VP tiering policy: <ul style="list-style-type: none"> <li>○ Highest Available Tier</li> <li>○ Start High then Auto-Tier</li> <li>○ Auto-Tier</li> <li>○ Lowest Available Tier</li> </ul> </li> <li>● Space Efficiency: <ul style="list-style-type: none"> <li>○ Thick</li> <li>○ Thin</li> </ul> </li> </ul> |

**Table 120. Capability profile attributes**

| Attribute                              | Description                                                                                                                                                                                                                                               |
|----------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ID                                     | Capability profile identifier.                                                                                                                                                                                                                            |
| Name                                   | Capability profile name.                                                                                                                                                                                                                                  |
| Description                            | Capability profile description.                                                                                                                                                                                                                           |
| VMware UUID                            | VMware UUID of the capability profile.                                                                                                                                                                                                                    |
| Storage pool                           | Associated storage pool identifier.                                                                                                                                                                                                                       |
| Service level                          | Service level of the underlying storage pool. Valid values are: <ul style="list-style-type: none"> <li>● Platinum</li> <li>● Gold</li> <li>● Silver</li> <li>● Bronze</li> </ul>                                                                          |
| Usage tag                              | Comma-separated list of user-defined tags. Each tag is an alphanumeric string value.                                                                                                                                                                      |
| Drive type                             | Specifies the drive type of the underlying storage pool. Valid values are: <ul style="list-style-type: none"> <li>● CapacityTier</li> <li>● PerformanceTier</li> <li>● ExtremePerformanceTier</li> <li>● MultiTier</li> <li>● ExtremeMultiTier</li> </ul> |
| RAID level (physical deployments only) | Specifies the RAID level of the underlying storage pool. Valid values are: <ul style="list-style-type: none"> <li>● RAID5</li> <li>● RAID10</li> <li>● RAID6</li> <li>● Mixed</li> </ul>                                                                  |
| FAST Cache (physical deployments only) | Indicates whether or not FAST Cache is enabled on the underlying storage pool. Valid values are: <ul style="list-style-type: none"> <li>● On</li> <li>● Off</li> </ul>                                                                                    |

**Table 120. Capability profile attributes (continued)**

| Attribute        | Description                                                                                                                                                                                                                                                               |
|------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| FAST VP policy   | Comma-separated list of FAST VP storage policies for the underlying storage pool. Valid values are: <ul style="list-style-type: none"> <li>• Start high then auto-tier</li> <li>• Auto-tier</li> <li>• Highest available tier</li> <li>• Lowest available tier</li> </ul> |
| Space efficiency | Comma-separated list of available space efficiency policies for the underlying storage pool. Valid values are: <ul style="list-style-type: none"> <li>• Thick</li> <li>• Thin</li> </ul>                                                                                  |
| Health state     | Health state.                                                                                                                                                                                                                                                             |
| Health details   | Additional health information.                                                                                                                                                                                                                                            |


## Create a capability profile

Create a capability profile for VVol datastores.

### Format

```
/stor/config/cp create [-async] -name <value> [-descr <value>] -pool <value> [-usageTag <value>]
```

### Action qualifier

| Qualifier | Description                                                                                                                                                                                                                                                                                            |
|-----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| -async    | Run the operation in asynchronous mode.                                                                                                                                                                                                                                                                |
| -name     | Type a name for the capability profile.<br> <b>NOTE:</b> The name may contain alphanumeric values, a hyphen, an underscore, and a period. It cannot start with hyphen or period, and cannot consist only of digits. |
| -descr    | Type a description for the capability profile.                                                                                                                                                                                                                                                         |
| -pool     | Specify the identifier of the storage pool the capability profile is based on.                                                                                                                                                                                                                         |
| -usageTag | Type a comma-separated list of user-specified usage tags. Each tag is an alphanumeric string value.                                                                                                                                                                                                    |

### Example

The following command creates a capability profile with these settings:

- Specifies a capability profile name of "CapabilityProfile1"
- Specifies that the capability profile is based on "pool\_1"
- Specifies the usage tag as "Production"
- Not specified to be created in asynchronous mode

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /stor/config/cp create -name
"CapabilityProfile1" -pool pool_1 -usageTag "Production"
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection
```

```
ID = cp_1
```

Operation completed successfully.

## View capability profiles

Displays a list of existing capability profiles and their characteristics.

### Format

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

### Object qualifier

| Qualifier | Description                            |
|-----------|----------------------------------------|
| -id       | Type the ID of the capability profile. |

### Example

The following command displays a list of existing capability profiles and their characteristics.

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

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

ID = cp_1
Name = CapabilityProfile1
Description =
VMware UUID = 550e8400-e29b-41d4-a716-446655440000
Storage pool = pool_1
Service level = Gold
Usage tag = Exchange, OLTP
Drive type = ExtremeMultiTier
RAID level = Mixed
FAST Cache = Off
FAST VP policy = Start high then auto-tier, Auto-tier, Highest available tier,
Lowest available tier
Space efficiency = Thin, Thick
Health state = OK (5)
Health details = "The component is operating normally. No action is required."
```

## Change capability profiles

Modify an existing capability profile.

### Format


```
/stor/config/cp -id <value> set [-async] [-name <value>] [-descr <value>] [{-addUsageTag <value> | -removeUsageTag <value>}]
```

### Object qualifier

| Qualifier | Description                                           |
|-----------|-------------------------------------------------------|
| -id       | Type the ID of the capability profile to be modified. |



## Action qualifier

| Qualifier       | Description                                                                                                                                                                                                                                                                                          |
|-----------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| -async          | Run the operation in asynchronous mode.                                                                                                                                                                                                                                                              |
| -name           | Type a name for the capability profile.<br> <b>NOTE:</b> The name may contain alphanumeric values, a hyphen, an underscore, and a period. It cannot start with hyphen or period, and cannot consist only of digits. |
| -descr          | Type a description for the capability profile.                                                                                                                                                                                                                                                       |
| -addUsageTag    | Comma-separated list of user-specified usage tags to be added to the specified capability profile. Each tag is an alphanumeric string value.                                                                                                                                                         |
| -removeUsageTag | Comma-separated list of user-specified usage tags to be removed from the specified capability profile. Each tag is an alphanumeric string value.                                                                                                                                                     |

## Example

The following command changes the name of capability profile "cp\_1".

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /stor/config/cp -id cp_1 set -name "CapabilityProfile2"
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection
```

```
ID = cp_1
Operation completed successfully.
```

## Delete capability profiles

Deletes specified capability profiles.

## Format

```
/stor/config/cp [-id <value>] delete [-async]
```

## Object qualifier

| Qualifier | Description                            |
|-----------|----------------------------------------|
| -id       | Type the ID of the capability profile. |

## Action qualifier

| Qualifier | Description                             |
|-----------|-----------------------------------------|
| -async    | Run the operation in asynchronous mode. |

## Example

The following command deletes capability profile cp\_1.

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /stor/config/cp -id cp_1 delete
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection


Operation completed successfully.
```

## Manage I/O limits

An I/O policy allows you to limit throughput and bandwidth, providing for more predictable performance in system workloads, that is, between hosts and applications and storage resources.

The following table lists the attributes for I/O limits:

**Table 121. I/O limit attributes**

| Attribute           | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|---------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ID                  | ID of the I/O limit.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Name                | Name of the I/O limit.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Description         | Brief description of the I/O limit.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| Shared              | Whether the I/O limit is shared, that is, whether settings are enforced on the sum of all the storage resources that have this policy or on each individual storage resource. Values are one of the following: <ul style="list-style-type: none"><li>• yes</li><li>• no (default)</li></ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Paused              | Whether the defined I/O limit policy is paused. Values are one of the following: <ul style="list-style-type: none"><li>• yes</li><li>• no</li></ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| Type                | Whether the I/O limit is absolute or density based. Values are one of the following: <ul style="list-style-type: none"><li>• absolute (default)</li><li>• density</li></ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Maximum IOPS        | Maximum I/O operations per second for an absolute limit policy.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Maximum KBPS        | Maximum KB per second for an absolute limit policy.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| Maximum IOPS per GB | Maximum IOPS per GB of size for the attached object. This is applicable only when the policy type is density based. The effective limit is the product of the maximum IOPS and the size in GB of the attached object.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Maximum KBPS per GB | Maximum KBPS per GB of size for the attached object. This is applicable only when the policy type is density based. The effective limit is the product of the maximum KBPS and the size in GB of the attached object.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Burst rate          | Amount of traffic over the base I/O limit that can occur during the burst time, expressed as a percentage of the base limit. Burst time and burst frequency must also be specified. Value is 1-100.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| Burst time          | Number of minutes during which traffic may exceed the base limit. Burst rate and burst frequency must also be specified. Use the following format: <i>&lt;value&gt;&lt;qualifier&gt;</i> where: <ul style="list-style-type: none"><li>• <i>value</i><ul style="list-style-type: none"><li>◦ minutes — Number of minutes within the range 1 - 60.</li></ul></li><li>• <i>qualifier</i><ul style="list-style-type: none"><li>◦ m — Indicates minutes.</li></ul></li></ul> <p> <b>NOTE:</b> This setting is not a hard limit and is used only to calculate the extra I/O operations allocated for bursting. The actual burst time depends on I/O activity and may be longer than defined when activity is lower than the allowed burst rate.</p> |

**Table 121. I/O limit attributes (continued)**

| Attribute            | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|----------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Burst frequency      | <p>Number of hours between the beginning of one burst and the following burst. Burst rate and burst time must also be specified. Use the following format: <code>&lt;value&gt;&lt;qualifier&gt;</code> where:</p> <ul style="list-style-type: none"> <li><code>value</code> <ul style="list-style-type: none"> <li>hours — Number of hours within the range 1 - 24.</li> </ul> </li> <li><code>qualifier</code> <ul style="list-style-type: none"> <li>h — Indicates hours.</li> </ul> </li> </ul> <p><b>NOTE:</b> When a burst policy setting is applied initially or changed, the burst frequency interval begins and the storage that is associated with the policy will burst immediately, regardless of when the last burst occurred.</p> |
| Effective IOPS limit | This is a read-only value that only applies to a shared policy. It is the total effective IOPS for all of the attached objects combined.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Effective KBPS limit | This is a read-only value that only applies to a shared policy. It is the total effective KBPS for all of the attached objects combined.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |

## Create an I/O limit policy

Create an I/O limit policy that can be applied to a storage resource.

### Format

```
/stor/config/iolimit create [-async] -name <value> [-descr <value>] [-shared {yes | no}] [-type {absolute | density}] [-maxIOPS <value>] [-maxKBPS <value>] [-maxIOPSDensity <value>] [-maxKBPSDensity <value>] [-burstRate <value> -burstTime <value> -burstFrequency <value>]
```

### Action qualifier

| Qualifier       | Description                                                                                                                                                                                 |
|-----------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| -async          | Run the operation in asynchronous mode.                                                                                                                                                     |
| -name           | Type the name of the I/O limit.                                                                                                                                                             |
| -descr          | Type a brief description of the I/O limit.                                                                                                                                                  |
| -shared         | Specify whether the I/O limit is shared. Values are one of the following: <ul style="list-style-type: none"> <li>yes</li> <li>no (default)</li> </ul>                                       |
| -type           | Specify whether an absolute or density-based policy will be created. Values are one of the following: <ul style="list-style-type: none"> <li>absolute (default)</li> <li>density</li> </ul> |
| -maxIOPS        | Specify the maximum IOPS. Cannot be specified when -type is density.                                                                                                                        |
| -maxKBPS        | Specify the maximum KBPS. Cannot be specified when -type is density.                                                                                                                        |
| -maxIOPSDensity | Specify the maximum IOPS per GB size of the attached object. Cannot be specified when -type is absolute.                                                                                    |
| -maxKBPSDensity | Specify the maximum KBPS per GB size of the attached object. Cannot be specified when -type is absolute.                                                                                    |
| -burstRate      | Specify the burst rate as a percentage over the base limit. Requires the use of -burstTime and -burstFrequency. Value is 1 - 100.                                                           |

| Qualifier       | Description                                                                                                                                                                                                                                                                                                                                    |
|-----------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| -burstTime      | Specify the time interval during which the burst rate is in effect, in minutes. Requires the use of -burstRate and -burstFrequency. Use the following format:<br><br><value>m, where: <ul style="list-style-type: none"> <li>• &lt;value&gt;—Number of minutes within the range 1 - 60.</li> <li>• m—Qualifier to identify minutes.</li> </ul> |
| -burstFrequency | Specify how often bursting is allowed in hours. Requires the use of -burstRate and -burstTime. Use the following format:<br><br><value>h, where: <ul style="list-style-type: none"> <li>• &lt;value&gt;—Number of hours within the range 1 - 24.</li> <li>• h—Qualifier to identify hours.</li> </ul>                                          |

## Example 1

The following command creates an I/O limit policy with these settings:

- Name is finance.
- Description is "for finance department."
- Shared.
- Type is absolute.
- Maximum IOPS of 500.
- Maximum KBPS of 1000.

The I/O limit policy receives the ID IOL\_1:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /stor/config/iolimit create -name
"finance" -descr "for finance department" -shared yes -type absolute -maxIOPS 500 -maxKBPS
1000
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

ID = IOL_1
Operation completed successfully.
```

## Example 2

The following command creates an I/O limit policy with these settings:

- Name is engineering.
- Description is "for engineering department."
- Unshared.
- Type is density based.
- Maximum IOPS per GB of 600.
- Maximum KBPS per GB of 2000.
- Burst rate of 30 percent.
- Burst time of five minutes.
- Burst frequency of two hours.

The I/O limit policy receives the ID IOL\_2:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /stor/config/iolimit create -name
"engineering" -descr "for engineering department" -shared yes -type density -maxIOPSDensity
600 -maxKBPSDensity 2000 -burstRate 30 -burstTime 5m -burstFrequency 2h
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection
```

```
ID = IOL_2
Operation completed successfully.
```

## Example 3

The following command failed because `-type` was set to `absolute`, but options only applicable to a `-type` of `density` were specified.

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /stor/config/iolimit create -name "HR2"
-type absolute -maxIOPSDensity 2000 -maxKBPSDensity 3000
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

Operation failed. Error code: 0x900912a
Mismatch between policy type and limit values. Absolute policy requires Maximum IOPS
and/or Maximum KBPS while Density-based policy requires Maximum IOPS per GB and/or
Maximum KBPS per GB. (Error Code:0x900912a)
```

## Example 4

The following command failed because `-type` was set to `density`, but options only applicable to a `-type` of `absolute` were specified.

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /stor/config/iolimit create -name "HR3"
-type density -maxIOPS 2000 -maxKBPS 3000
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

Operation failed. Error code: 0x900912a
Mismatch between policy type and limit values. Absolute policy requires Maximum IOPS
and/or Maximum KBPS while Density-based policy requires Maximum IOPS per GB and/or
Maximum KBPS per GB. (Error Code:0x900912a)
```

## Delete an I/O limit policy

Delete an I/O limit policy.

### Format

```
/stor/config/iolimit -id <value> delete [-async] [-force]
```

### Object qualifier

| Qualifier        | Description                            |
|------------------|----------------------------------------|
| <code>-id</code> | Type the name of the I/O limit policy. |

### Action qualifier

| Qualifier           | Description                             |
|---------------------|-----------------------------------------|
| <code>-async</code> | Run the operation in asynchronous mode. |

| Qualifier | Description                                                                                                                                                                                                                                                          |
|-----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| -force    | Specify whether an I/O limit policy can be deleted when it is still being used by storage resources or snapshots. If not specified, an error is given. Otherwise the I/O limit policy is removed from all storage resources and/or snapshots before it gets deleted. |

## Example

The following command deletes I/O limit policy IOL\_1:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /stor/config/iolimit -id IOL_1 delete
```

```
Storage system address: 10.64.75.201
Storage system port: 443
HTTPS connection
```

```
Operation completed successfully.
```

## Change an I/O limit policy

Change the settings of an existing I/O limit policy.

### Format

```
/stor/config/iolimit -id <value> set [-async] [-name <value>] [-descr <value>] [-paused {yes | no}] [-type {absolute | density}] [{-maxIOPS <value> | -noMaxIOPS}] [{-maxKBPS <value> | -noMaxKBPS}] [{-maxIOPSDensity <value> | -noMaxIOPSDensity}] [{-maxKBPSDensity <value> | -noMaxKBPSDensity}] [{-noBurst | [-burstRate <value> -burstTime <value> -burstFrequency <value>]}]
```

### Object qualifier

| Qualifier | Description                                      |
|-----------|--------------------------------------------------|
| -id       | Type the name of the I/O limit policy to change. |

### Action qualifier

| Qualifier  | Description                                                                                                                                                                                  |
|------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| -async     | Run the operation in asynchronous mode.                                                                                                                                                      |
| -name      | Type the name of the I/O limit.                                                                                                                                                              |
| -descr     | Type a brief description of the I/O limit.                                                                                                                                                   |
| -paused    | Indicates whether the defined I/O limit policy is paused or resumed. Values are one of the following: <ul style="list-style-type: none"> <li>yes</li> <li>no (default)</li> </ul>            |
| -type      | Specify whether and absolute or density-based policy will be created. Values are one of the following: <ul style="list-style-type: none"> <li>absolute (default)</li> <li>density</li> </ul> |
| -maxIOPS   | Specify the maximum IOPS.                                                                                                                                                                    |
| -maxKBPS   | Specify the maximum KBPS.                                                                                                                                                                    |
| -noMaxIOPS | Specify to clear the -maxIOPS setting.                                                                                                                                                       |

| Qualifier         | Description                                                                                                                                                                                                                                                                                                                                   |
|-------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| -noMaxKBPS        | Specify to clear the -maxKBPS setting.                                                                                                                                                                                                                                                                                                        |
| -maxIOPSDensity   | Specify the maximum IOPS per GB size of the attached object.                                                                                                                                                                                                                                                                                  |
| -maxKBPSDensity   | Specify the maximum KBPS per GB size of the attached object.                                                                                                                                                                                                                                                                                  |
| -nomaxIOPSDensity | Specify to clear the -maxIOPSDensity setting.                                                                                                                                                                                                                                                                                                 |
| -nomaxKBPSDensity | Specify to clear the -maxKBPSDensity setting.                                                                                                                                                                                                                                                                                                 |
| -noBurst          | Specify to disable bursting for current I/O limit policy and clear the values for -burstRate, -burstTime, and -burstFrequency.                                                                                                                                                                                                                |
| -burstRate        | Specify the burst rate as a percentage over the base limit. Requires the use of -burstTime and -burstFrequency. Value is 1 - 100.                                                                                                                                                                                                             |
| -burstTime        | Specify the time interval during which the burst rate is in effect in minutes. Requires the use of -burstRate and -burstFrequency. Use the following format:<br><br><value>m, where: <ul style="list-style-type: none"> <li>• &lt;value&gt;—Number of minutes within the range 1 - 60.</li> <li>• m—Qualifier to identify minutes.</li> </ul> |
| -burstFrequency   | Specify how often bursting is allowed in hours. Requires the use of -burstRate and -burstTime. Use the following format:<br><br><value>h, where: <ul style="list-style-type: none"> <li>• &lt;value&gt;—Number of hours within the range 1 - 24.</li> <li>• h—Qualifier to identify hours.</li> </ul>                                         |

## Example 1

The following command updates I/O limit policy IOL\_1 with these settings:

- Name is engineering.
- Maximum IOPS to 1000.
- Clears the maximum KBPS setting.

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /stor/config/iolimit -id IOL_1 set -name "engineering" -maxIOPS 1000 -noKBPS
```

```
Storage system address: 10.64.75.201
Storage system port: 443
HTTPS connection
```

```
Operation completed successfully.
```

## Example 2

The following command pauses I/O limit policy IOL\_1:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /stor/config/iolimit -id IOL_1 set -paused yes
```

```
Storage system address: 10.64.75.201
Storage system port: 443
HTTPS connection
```

```
Operation completed successfully.
```

## View I/O limit policies

Display the settings for the specified I/O limit policy or for all existing I/O limit policies.

### Format

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

### Object qualifier

| Qualifier | Description                                       |
|-----------|---------------------------------------------------|
| -id       | Type the name of the I/O limit policy to display. |

### Example


The following command displays details about all I/O limit policies on the system:

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

```
Storage system address: 10.64.75.201
Storage system port: 443
HTTPS connection

1: ID = IOL_1
 Name = Finance
 Description = for finance department
 Shared = yes
 Paused = yes
 Type = absolute
 Maximum IOPS = 500
 Maximum KBPS = 1000
 Maximum IOPS per GB =
 Maximum KBPS per GB =
 Burst rate =
 Burst time =
 Burst frequency =
 Effective IOPS limit = 500
 Effective KBPS limit = 1000

2: ID = IOL_2
 Name = Engineering
 Description = for engineering department
 Shared = no
 Paused = no
 Type = density
 Maximum IOPS =
 Maximum KBPS =
 Maximum IOPS per GB = 600
 Maximum KBPS per GB = 2000
 Burst rate = 30%
 Burst time = 5m
 Burst frequency = 2h
 Effective IOPS limit = 1800
 Effective KBPS limit = 6000
```

 **NOTE:** The object attached to IOL\_2 in this example has 3 GB of storage.



# Manage I/O limit configuration

An I/O policy allows you to limit throughput and bandwidth, providing for more predictable performance in system workloads, that is, between hosts and applications and storage resources.

An I/O limit policy can be applied to an individual LUN or to a group of LUNs. Only one I/O limit policy can be applied to an individual LUN or a LUN that is a member of a consistency group.

The following table lists the attributes for I/O limit configurations:

Table 122. I/O limit configuration attributes

| Attribute                            | Description                                                                                                                       |
|--------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------|
| IO limits paused                     | Whether the defined I/O limit policies defined on the system are enforced.                                                        |
| Maximum controllable storage objects | Maximum number of storage objects that can have I/O limits enforced; this includes both storage resources and attached snapshots. |
| Actively controlled storage objects  | Number of storage objects that currently have I/O limits enforced; this includes both storage resources and attached snapshots.   |

## View I/O limit configuration setting

Display the settings for the existing I/O limit configuration setting.

### Format

```
/stor/config/iolimit/config show
```

### Example


The following command displays the I/O limits defined on the system:

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

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection
1: IO limits paused = yes
 Max controllable storage objects = 512
 Actively controlled storage objects = 200
```

## Enforce use of I/O limit configuration setting

Enforce the use of the existing I/O limit configuration setting across the system.

 **NOTE:** Enforcement of host I/O limits is controlled globally across your system. You cannot disable or enable the use of a particular policy.

### Format

```
/stor/config/iolimit/config set -paused {yes|no}
```

## Action qualifier

| Qualifier | Description                                                                                    |
|-----------|------------------------------------------------------------------------------------------------|
| -paused   | Specify whether the I/O limit policies defined on the system are enforced. Value is yes or no. |

## Example

The following command enforces the use of I/O limits on the system:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /stor/config/iolimit/config set -paused
no
```

```
Storage system address: 10.64.75.201
Storage system port: 443
HTTPS connection
```

```
Operation completed successfully.
```

# Protect Data

This chapter contains the following topics:

## Topics:

- [Manage snapshots](#)
- [Manage snapshot NFS shares](#)
- [Manage snapshot CIFS shares](#)
- [Manage replication sessions](#)
- [Manage virtual RecoverPoint appliance CHAP accounts](#)
- [Manage Data at Rest Encryption \(physical deployments only\)](#)
- [Manage KMIP support \(physical deployments only\)](#)


## 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 file systems and LUNs 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 90 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 for recovering from disasters or the loss of physical equipment.

The following table lists the attributes for snapshots:

**Table 123. Snapshot attributes**

| Attribute      | Description                                                                                                                                                                                              |
|----------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ID             | ID of the snapshot.                                                                                                                                                                                      |
| Name           | Name of the snapshot.                                                                                                                                                                                    |
| State          | State of the snapshot. Valid values are: <ul style="list-style-type: none"> <li>• initializing</li> <li>• ready</li> <li>• faulted</li> <li>• offline</li> <li>• destroying</li> </ul>                   |
| Attached       | Indicates whether the snapshot is attached to a host.<br> <b>NOTE:</b> This field is blank for file system snapshots. |
| Source         | ID of the storage resource of which the system created the snapshot.                                                                                                                                     |
| Source type    | Type of storage resource of which the system created the snapshot.                                                                                                                                       |
| Attach details | Comma-separated list of export paths or WWNs for attached snapshots.                                                                                                                                     |

**Table 123. Snapshot attributes (continued)**

| Attribute              | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Members                | Comma-separated list of the member LUNs of the snapshot.<br> <b>NOTE:</b> This field is blank for file system snapshots.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Source snapshot        | For a snapshot of a snapshot, the ID of the parent snapshot.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Description            | Snapshot description.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Creation time          | Date and time when the snapshot was created.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Expiration time        | Date and time when the snapshot will expire and be deleted from the system. Default is 7 days.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Last writable time     | Last time the snapshot or its parent snapshot was detached.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Last refresh time      | Indicates the last time that the snapshot was refreshed.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Created by             | Name of the user, protection schedule, or backup process that created the snapshot. Valid values are: <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 file system 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> </ul> |
| Modified               | Indicates whether the snapshot is or was previously attached to a snapshot mount point, or has shares. Valid values are: <ul style="list-style-type: none"> <li>yes</li> <li>no</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Allow auto-delete      | Indicates whether or not the system can automatically delete the snapshot. Valid values are: <ul style="list-style-type: none"> <li>yes</li> <li>no</li> </ul> Default value is yes.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Size                   | Pool capacity consumed by the snapshot.<br> <b>NOTE:</b> This field is blank for snapshots of consistency groups and VMware block applications.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Access                 | Indicates whether a file system snapshot is a read-only checkpoint, or read/write for user access.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| IO limit               | Comma-separated IO limit policy IDs for the attached snapshots of block-based storage resources. Members of a snapshot group can have different IO limit policy IDs.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Effective maximum IOPS | Dependant on the policy type. For a density-based policy, this value is the product of the maximum IOPS and the size of the attached snapshot. This is a read-only attribute.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Effective maximum KBPS | Dependant on the policy type. For a density-based policy, this value is the product of the maximum KBPS and the size of the attached snapshot. This is a read-only attribute.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Read/write hosts       | Comma-separated list of identifiers of hosts allowed writing data. Applies only if the snapshot is attached to a dynamic snapshot mount point.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Read-only hosts        | Comma-separated list of identifiers of hosts allowed reading data. Applies only if the snapshot is attached to a dynamic snapshot mount point.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Replicated             | Indicates whether the snapshot is asynchronously replicated. Valid values:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |

**Table 123. Snapshot attributes (continued)**

| Attribute                | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|--------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                          | <ul style="list-style-type: none"> <li>no—Not marked for replication</li> <li>pending—Marked for replication, but waiting synchronization</li> <li>yes—Successfully replicated to destination</li> <li>failed to replicate, check System Alerts for details—Failed to replicate</li> </ul>                                                                                                                                                                                                                                                                               |
| Sync replicated          | <p>Indicates whether the snapshot participates in a synchronous replication session. Valid values:</p> <ul style="list-style-type: none"> <li>no—Either the snapshot was created on the destination site and will not be replicated on the source, or the snapshot was created before a synchronous replication session was set up.</li> <li>yes—Successfully replicated.</li> <li>failed to replicate—Snapshot was created on the source site while a replication session was in a fractured state. The snapshot was not replicated to the destination site.</li> </ul> |
| Remote expiration time   | Time when the snapshot will be removed on the destination.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Remote allow auto-delete | <p>Indicates whether this snapshot participates in auto-delete on the destination. Valid values are:</p> <ul style="list-style-type: none"> <li>yes</li> <li>no</li> </ul> <p>Default value is no.</p>                                                                                                                                                                                                                                                                                                                                                                   |

## Create snapshots

Create a snapshot of a storage resource.

**i NOTE:** Snapshots of LUNs are not intended for use as mirrors, disaster recovery, or high-availability tools. Because LUN snapshots are partially derived from real-time data on the LUNs, snapshots can become inaccessible (not readable) if the primary LUN becomes inaccessible.

## Prerequisites


Snapshots are stored in the protection capacity of the storage resource. Ensure that enough protection capacity exists to accommodate snapshots. [View file systems](#) on page 333 explains how to view the current protection storage size for file systems. [View LUNs](#) on page 371 explains how to view the current protection size for LUNs.

## Format

```
/prot/snap create [-async] [-name <value>] [-descr <value>] [{-keepFor <value> | -allowAutoDelete {yes | no}}] [-access {ckpt | share}] [-replicate [{-keepSameAsSource | -keepRemotelyFor <value> | -allowRemoteAutoDelete {yes | no}}]]
```

## Action qualifiers

| Qualifier | Description                             |
|-----------|-----------------------------------------|
| -async    | Run the operation in asynchronous mode. |
| -name     | Type a name for the snapshot.           |
| -descr    | Type a description for the snapshot.    |

| Qualifier              | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| -source                | Type the ID of the storage resource of which to take a snapshot. <a href="#">View file systems</a> on page 333 explains how to view the settings for file systems. <a href="#">View consistency groups</a> on page 380 explains how to view the settings for iSCSI storage resources                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| -keepFor               | <p>Specify the amount of time to retain a snapshot before it expires. The interval can be defined in days or hours. The system deletes expired snapshots automatically. Use the following format:</p> <pre>&lt;value&gt;&lt;qualifier&gt;</pre> <p>where:</p> <ul style="list-style-type: none"> <li>• <b>value</b> — Type the number of hours or days: <ul style="list-style-type: none"> <li>◦ For hours, the range is 1–8760.</li> <li>◦ For days, the range is 1–365.</li> </ul> </li> <li>• <b>qualifier</b> — Type the value qualifier. Value is one of the following: <ul style="list-style-type: none"> <li>◦ <b>h</b> – Indicates hours.</li> <li>◦ <b>d</b> – Indicates days.</li> </ul> </li> </ul> <p> <b>NOTE:</b> For scheduled snapshots, which are associated with a schedule, include the -keepFor qualifier in the schedule rules to specify the retention period. <a href="#">Manage task rules</a> on page 92 provides details about schedule rules.</p> |
| -allowAutoDelete       | <p>Specify whether the system can automatically delete the snapshot or snapshot set. Valid values are:</p> <ul style="list-style-type: none"> <li>• <b>yes</b> (default)</li> <li>• <b>no</b></li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| -access                | <p>Specify whether the snapshot is a read-only checkpoint, or read/write for CIFS (SMB) shares or NFS exports. Valid values are:</p> <ul style="list-style-type: none"> <li>• <b>ckpt</b> (default)</li> <li>• <b>share</b></li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| -replicateSnap         | <p>Specify whether to mark this snapshot for replication. Valid values:</p> <ul style="list-style-type: none"> <li>• <b>yes</b></li> <li>• <b>no</b> (default)</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| -keepSameAsSource      | Indicates whether to use the same retention policy (expiration time and auto-delete) of the source for the destination. This is a one-time copy of the source snapshot retention policy and the remote retention policy does not update if the source retention policy is changed. No values are allowed.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| -keepRemotelyFor       | <p>Specifies the retention time after which the snapshot is deleted on the destination. The interval can be defined in days or hours. The format of the value is as follows:</p> <pre>&lt;value&gt;&lt;qualifier&gt;</pre> <p>where:</p> <ul style="list-style-type: none"> <li>• <b>value</b> - - An integer value. If the <i>qualifier</i> is <b>h</b> (hours), the valid range is from 1 to 43800. If the <i>qualifier</i> is <b>d</b> (days), the valid range is from 1 to 1825.</li> <li>• <b>qualifier</b> - A value qualifier. The valid values are <b>h</b> (hours) and <b>d</b> (days).</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| -allowRemoteAutoDelete | <p>Indicates whether auto delete is allowed on the replicated copy of this snapshot or snapshot set. Valid values are:</p> <ul style="list-style-type: none"> <li>• <b>yes</b></li> <li>• <b>no</b></li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |

## Example

The following command takes a snapshot of a file system with these settings:

- Name is accounting.
- Storage resource is file system FS\_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 -source FS_1 -keepFor 1d
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection
```

```
ID = SNAP_1
Operation completed successfully.
```

## View snapshots


View details about snapshots on the system. You can filter on the snapshot ID, snapshot name, or storage resource ID.

 **NOTE:** The `show` action command on page 21 explains how to change the output format.

### Format

```
/prot/snap [{-id <value> | -name <value>} [-members] | -source <value>}] show
```

### Object qualifier

| Qualifier | Description                                                                                                                                                                                                                                                 |
|-----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| -id       | Identifies the ID of a snapshot.                                                                                                                                                                                                                            |
| -name     | Identifies the name of the snapshot.                                                                                                                                                                                                                        |
| -members  | Flag indicating that only member snapshots will be shown.<br> <b>NOTE:</b> This is applicable to snapshots of Consistency groups and VMware VMFS storage resources only. |
| -source   | Identifies 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 -detail
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

1: ID = 171798691881
 Name = FS_Snapshot1
 State = Ready
 Attached = no
 Resource = res_1
 Resource Type = File system
 Source = res_1
 Source Type = File system
 Members =
 Attach details =
 Source Snapshot =
 Description =
 Creation time = 2016-06-27 17:02:07
 Expiration time = Never
 Last writable time = Never
 Last refresh time = Never
 Created by = admin
 Modified = no
```

```

Allow auto-delete = yes
Size = 3221225472 (3.0G)
Access = Protocol
IO limit =
Effective maximum IOPS =
Effective maximum KBPS =
Replicated = pending
Sync replicated = no
Remote expiration time = Never
Remote allow auto-delete = yes
Read/write hosts =
Read-only hosts =

```

## Attach snapshots to hosts

For snapshots of storage resources, attach a snapshot to make it available to hosts.

**NOTE:** If the default attach type is used, before a host can access an attached snapshot, it must have snapshot permissions to the appropriate storage resource. [Manage LUNs](#) on page 366 explains how to configure host access permissions for LUN storage resources.

### Format

```

/prot/snap {-id <value> | -name <value>} attach [-async] [-copyName <value>] [-type
{default | dynamic [-roHosts <value>] [-rwHosts <value>] [-force {yes | no}]]}

```

### Object qualifier

| Qualifier | Description                              |
|-----------|------------------------------------------|
| -id       | Type the ID of the snapshot to attach.   |
| -name     | Type the name of the snapshot to attach. |

### Action qualifiers

| Qualifier | Description                                                                                                                                                                                                                                                                                                    |
|-----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| -async    | Run the operation in asynchronous mode.                                                                                                                                                                                                                                                                        |
| -copyName | Specify the name of the copy the system creates before attaching the selected snapshot. If this switch is specified and no name is provided, the system assigns a name to the copy.<br><b>NOTE:</b> If this switch is not specified, no copy is created.                                                       |
| -type     | Attachment type. Valid values are (case insensitive): <ul style="list-style-type: none"> <li>default (default)—Allows promoting only one snapshot of the parent storage resource at a time.</li> <li>dynamic—Allows promoting several snapshots of the same parent storage resource simultaneously.</li> </ul> |
| -roHosts  | Specify the comma-separated list of hosts that have read-only access to the snapshot.                                                                                                                                                                                                                          |
| -rwHosts  | Specify the comma-separated list of hosts that have read/write access to the snapshot.                                                                                                                                                                                                                         |
| -force    | Specify that read-write access for the snapshot can be configured, even though the object has independent thin clones. Valid values are: <ul style="list-style-type: none"> <li>yes</li> <li>no (default)</li> </ul>                                                                                           |



## Example


The following command attaches snapshot SNAP\_1:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /prot/snap -id SNAP_1 attach -type dynamic -roHosts Host_1,Host_2 -rwHosts Host_3,Host_4
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

Operation completed successfully.
```

## Refresh snapshots

 **NOTE:** The refresh snapshots command is only valid for block snapshots.


### Format

```
/prot/snap {-id <value> | -name <value>} refresh [-async] [-copyName <value>]
```

### Object qualifier

| Qualifier | Description                      |
|-----------|----------------------------------|
| -id       | ID of the snapshot to refresh.   |
| -name     | Name of the snapshot to refresh. |

### Action qualifiers

| Qualifier | Description                                                                                                                                                                                                                                                                                                                     |
|-----------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| -async    | Run the operation in asynchronous mode.                                                                                                                                                                                                                                                                                         |
| -copyName | Specify the name of the copy the system creates before the refresh operation. If the name specified is blank (""), a copy will be created with a date/time stamp name.<br> <b>NOTE:</b> If this switch is not specified, no copy is created. |

## Example


The following command refreshes a snapshot:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /prot/snap -id 38654705680 refresh -copyName copy1
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

ID = 38654705680
Operation completed successfully
```

## Replicate snapshots

 **NOTE:** Use to replicate snapshots after they have been created.

### Format

```
/prot/snap {-id <value> | -name <value>} replicate {-keepSameAsSource | -keepRemotelyFor <value> | -allowRemoteAutoDelete {yes | no}}
```

### Object qualifier

| Qualifier | Description                          |
|-----------|--------------------------------------|
| -id       | Identifies the snapshot.             |
| -name     | Identifies the snapshot by its name. |

### Action qualifier

| Qualifier              | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| -keepSameAsSource      | Indicates whether or not to use the same retention policy (expiration time and auto-delete) of the source for the destination. This is a one-time copy of the source snapshot retention policy and the remote retention policy does not update if the source retention policy is changed.                                                                                                                                                                                                                                                                                                                                                                                                             |
| -keepRemotelyFor       | Specifies the retention period after which the snapshot is deleted on the destination. The interval can be defined in days or hours. The format of the value is the following:<br><br><code>&lt;value&gt;&lt;qualifier&gt;</code><br><br>where: <ul style="list-style-type: none"><li>• <code>value</code>—Type the number of hours or days:<ul style="list-style-type: none"><li>◦ For hours, the range is 1–43800.</li><li>◦ For days, the range is 1–1825.</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> |
| -allowRemoteAutoDelete | Indicates whether auto delete is allowed on the replicated copy of this Snapshot or Snapshot Set. Valid values are: <ul style="list-style-type: none"><li>• <code>yes</code></li><li>• <code>no</code></li></ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |

### Example

The following command replicates a snapshot:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /prot/snap -id 38654705680 replicate -keepRemotelyFor 1d
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection
```

```
Operation completed successfully.
```

# Detach snapshots

For snapshots of storage resources, detach an attached snapshot to block host access to the snapshot.

**NOTE:** Before a host can access an attached snapshot, it must have snapshot permissions to the appropriate storage resource. [Manage LUNs](#) on page 366 explains how to configure host access permissions for LUN storage.

## Format

```
/prot/snap {-id <value> | -name <value> } detach [-async]
```

## Object qualifier

| Qualifier | Description                              |
|-----------|------------------------------------------|
| -id       | Type the ID of the snapshot to detach.   |
| -name     | Type the name of the snapshot to detach. |

## Action qualifiers

| Qualifier | Description                             |
|-----------|-----------------------------------------|
| -async    | Run the operation in asynchronous mode. |

## Example

The following command detaches snapshot SNAP\_1:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /prot/snap -id SNAP_1 detach
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

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.

When you restore a storage resource to a snapshot, before the restoration begins, the system will automatically create a snapshot of the storage resource's current state. This ensures that there is no unintentional data loss because of the restore operation. You can use this new snapshot later to restore the storage resource back to its previous state, if necessary.

## 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 LUN storage:
  - If the snapshot is attached, you must first detach it or an error will appear when you attempt to restore to it.
  - If a host is connected to the LUN (seen by the host as a disk) you want to restore, perform one of the following to the LUN to disconnect it from the host:
    - On Windows, disable the LUN in the Device Manager, which might require a host reboot.
    - On Linux/UNIX, run the unmount command on the virtual.

Once the LUN is disconnected, you can continue with the restore and then enable and mount the restored LUN on the host.

## Format

```
/prot/snap {-id <value> | -name <value> } restore [-backupName <value>] [-async]
```

## Object qualifier

| Qualifier | Description                                                                                  |
|-----------|----------------------------------------------------------------------------------------------|
| -id       | Type the ID of the snapshot to which you want to restore the associated storage resource.    |
| -name     | Type the name of the snapshot to which you want to restore the associated storage resources. |

## Action qualifiers

| Qualifier   | Description                                                                                                                                                                                      |
|-------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| -async      | Run the operation in asynchronous mode.                                                                                                                                                          |
| -backupName | Specifies the name of the snapshot the system creates automatically as the initial step of the restoration process. The system assigns a name to this snapshot if the user does not provide one. |

## Example

The following command restores snapshot SNAP\_1, which is a snapshot of iSCSI storage:


```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /prot/snap -id SNAP_1 restore
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

Operation completed successfully.
```

## Delete snapshots

Delete (destroy) a snapshot of a storage resource.

 **NOTE:** 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> | -name <value>} delete [-async] [-overrideLock] [-force]
```

## Object qualifier

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

## Action qualifiers

| Qualifier     | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|---------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| -async        | Run the operation in asynchronous mode.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| -overrideLock | Override the restriction preventing the deletion of a snapshot that is locked by an application. Attempting to delete a locked snapshot without this option specified will return an error message containing the details of the application that has the snapshot locked.<br> <b>NOTE:</b> Do not use this option if applications are currently referencing the snap, to avoid a performance impact on these applications. This option will not bypass all restrictions, only the lock that certain applications may have on the snapshot. |
| -force        | Unconditionally removes the snapshot on the destination site, even if it is marked as replicated by the synchronous replication session.<br> <b>NOTE:</b> This option is applicable for synchronous destination site snapshots only.                                                                                                                                                                                                                                                                                                        |

## 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
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

Operation completed successfully.
```

## Copy snapshots

Copy a snapshot.


### Format

```
/prot/snap { -id <value> | -name <value> } copy [-async] [-copyName <value>]
```

### Object qualifier

| Qualifier | Description                                                                                  |
|-----------|----------------------------------------------------------------------------------------------|
| -id       | Type the ID of the snapshot to which you want to restore the associated storage resource.    |
| -name     | Type the name of the snapshot to which you want to restore the associated storage resources. |

## Action qualifiers

| Qualifier | Description                                                                                                                                                                                                                                                                                                                               |
|-----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| -async    | Run the operation in asynchronous mode.                                                                                                                                                                                                                                                                                                   |
| -copyName | Type the name of the copy the system creates before attaching the selected snapshot. If this switch is specified and no name is provided, the system assigns a name to the copy.<br> <b>NOTE:</b> If this switch is not specified, no copy is created. |

## Example

The following command creates a copy of SNAP\_1 named SNAP\_Copy:

- Name is accounting.

The snapshot receives ID SNAP\_1:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /prot/snap -id SNAP_1 copy -copyName SNAP_Copy
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection
```

```
ID = SNAP_1
Operation completed successfully.
```

## Modify snapshots

Change the settings of a snapshot.

### Format



```
/prot/snap {-id <value> | -name <value>} set [-async] [-newName <value>] [-descr <value>]
[{-keepFor <value> | -allowAutoDelete {yes|no}}] [-roHosts <value> -rwHosts <value>] [-force]
```

### Object qualifier

| Qualifier | Description                                                                                  |
|-----------|----------------------------------------------------------------------------------------------|
| -id       | Type the ID of the snapshot to which you want to restore the associated storage resource.    |
| -name     | Type the name of the snapshot to which you want to restore the associated storage resources. |

### Action qualifiers

| Qualifier | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|-----------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| -async    | Run the operation in asynchronous mode.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| -newName  | Type a new name for the snapshot.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| -descr    | Type a description for the snapshot.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| -keepFor  | <p>Specify the amount of time to retain a snapshot before it expires. The interval can be defined in days or hours. The system deletes expired snapshots automatically. Use the following format:</p> <p>&lt;value&gt;&lt;qualifier&gt;</p> <p>where:</p> <ul style="list-style-type: none"><li>• &lt;value&gt;—Type the number of hours or days:<ul style="list-style-type: none"><li>○ For hours, the range is 1–8760.</li><li>○ For days, the range is 1–365.</li></ul></li><li>• &lt;qualifier&gt;—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> |

| Qualifier                     | Description                                                                                                                                                                                                                                                                                                                                          |
|-------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                               |  <b>NOTE:</b> For scheduled snapshots, which are associated with a schedule, include the <code>-keepFor</code> qualifier in the schedule rules to specify the retention period. <a href="#">Manage task rules</a> on page 92 provides details about schedule rules. |
| <code>-allowAutoDelete</code> | Specify whether the system can automatically delete the snapshot or snapshot set. Valid values are: <ul style="list-style-type: none"> <li>• <code>yes</code></li> <li>• <code>no</code></li> </ul>                                                                                                                                                  |
| <code>-roHosts</code>         | Specify a comma-separated list of hosts that will have read-only access to the snapshot. This option applies only if the snapshot is attached to a dynamic snapshot mount point.                                                                                                                                                                     |
| <code>-rwHosts</code>         | Specify a comma-separated list of hosts that will have read/write access to the snapshot. This option applies only if the snapshot is attached to a dynamic snapshot mount point.                                                                                                                                                                    |
| <code>-force</code>           | Unconditionally modifies the snapshot on the destination site, even if it is marked as replicated by the synchronous replication session.<br> <b>NOTE:</b> This option is applicable for synchronous destination site snapshots only.                               |

## Example

The following command changes the name of snapshot SNAP\_1 to MySnap:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /prot/snap -id SNAP_1 set -newName MySnap
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

ID = SNAP_1
Operation completed successfully.
```

## Manage snapshot NFS shares

The following table lists the attributes for snapshot NFS share:

**Table 124. Snapshot NFS share attributes**

| Attribute        | Description                                                                                                                                                                                                                                                                   |
|------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ID               | ID of the snapshot NFS share.                                                                                                                                                                                                                                                 |
| Name             | Name of the snapshot NFS share.                                                                                                                                                                                                                                               |
| Description      | Description of the snapshot NFS share.                                                                                                                                                                                                                                        |
| Snapshot         | Parent snapshot (see <a href="#">Manage snapshots</a> on page 435.)                                                                                                                                                                                                           |
| Local path       | Local path to be exported.                                                                                                                                                                                                                                                    |
| Export path      | Export path to the share.                                                                                                                                                                                                                                                     |
| Default access   | Specifies the default access level. Valid values are: <ul style="list-style-type: none"> <li>• <code>ro</code> — Read-only access</li> <li>• <code>rw</code> — Read/write access</li> <li>• <code>root</code> — Root access</li> <li>• <code>na</code> — No access</li> </ul> |
| Read-only hosts  | Comma-separated list of identifiers of hosts allowed reading data.                                                                                                                                                                                                            |
| Read/write hosts | Comma-separated list of identifiers of hosts allowed reading and writing data.                                                                                                                                                                                                |
| Root hosts       | Comma-separated list of identifiers of hosts with root permissions.                                                                                                                                                                                                           |

**Table 124. Snapshot NFS share attributes (continued)**

| Attribute          | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|--------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| No access hosts    | Comma-separated list of identifiers of hosts without access.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| Creation time      | Creation time of the share.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Last modified time | Last modified time of the share.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Role               | <p>Role of the snapshot NFS share. Valid values are:</p> <ul style="list-style-type: none"> <li>• <code>backup</code> – Indicates that the snapshot share is operating in a backup role. Applies to snapshot shares created for the purposes of backup and disaster/recovery on a NAS server operating in a replication destination mode.</li> </ul> <p><b>NOTE:</b> When a NAS server fails over, and becomes the source system in a replication, the role of snapshot shares on the NAS server still reflect the backup role.</p> <ul style="list-style-type: none"> <li>• <code>production</code> – Indicates that the snapshot share is operating in a production role. On NAS servers that are not acting as a replication destination, all snapshot shares operate in a production mode.</li> </ul> |
| Minimum security   | <p>The minimal security option that must be provided by a client for the NFS mount operation. Valid values are (from least secure to most secure):</p> <ul style="list-style-type: none"> <li>• <code>sys</code> – Also known as AUTH_SYS security. This indicates there is no server-side authentication. When secure NFS is not configured on a NAS server, this is the default value.</li> <li>• <code>krb5</code> – Kerberos v5 authentication. This is the default value when secure NFS is configured on the NAS server.</li> <li>• <code>krb5i</code> – Kerberos v5 authentication and integrity.</li> <li>• <code>krb5p</code> – Kerberos v5 authentication and integrity, with encryption enabled.</li> </ul>                                                                                    |

- NOTE:** Read-only hosts, Read/write hosts, Root hosts, and No access hosts attributes are displayed as a comma-separated list of pairs of host identifiers and tokens enclosed with square brackets. The token format depends on the host type:
- `host` — Comma-separated list of IP addresses.
  - `subnet` — Pair of IP address and netmask delimited by slash.
  - `netgroup` — Netgroup network address.

## Create NFS snapshots

Create a snapshot NFS share.

### Format

```
/prot/snap/nfs create [-async] -name <value> [-descr <value>] -snap <value> -path <value>
[-defAccess {ro | rw | root | na}] [-roHosts <value>] [-rwHosts <value>] [-rootHosts
<value>] [-naHosts <value>] [-secEnforced {sys | krb5 | krb5i | krb5p}]
```

### Action qualifier

| Qualifier           | Description                                                                        |
|---------------------|------------------------------------------------------------------------------------|
| <code>-async</code> | Run the operation in asynchronous mode.                                            |
| <code>-name</code>  | Type the username of the share.                                                    |
| <code>-descr</code> | Type the description of the share.                                                 |
| <code>-snap</code>  | Type the snapshot to associate the share with.                                     |
| <code>-path</code>  | Type the path at which to mount the file system. Default value is <code>/</code> . |



| Qualifier    | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|--------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| -defAccess   | Specifies the new user description of the share. Valid values are: <ul style="list-style-type: none"> <li>ro — Read-only access</li> <li>rw — Read/Write access</li> <li>root — Root access</li> <li>na — No access</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                |
| -roHosts     | Specifies the comma-separated list of identifiers of hosts allowed to read. Optionally, it's allowed to select the IP addresses of the host of type host. They shall be defined as a comma-separated list of IP addresses enclosed with square brackets and following the host identifier.                                                                                                                                                                                                                                                                                                                                                                    |
| -rwHosts     | Specifies the comma-separated list of identifiers of hosts allowed to read and write. Optionally, it's allowed to select the IP addresses of the host of type host. They shall be defined as a comma-separated list of IP addresses enclosed with square brackets and following the host identifier.                                                                                                                                                                                                                                                                                                                                                          |
| -rootHosts   | Specifies the comma-separated list of identifiers of hosts with root permissions. Optionally, it's allowed to select the IP addresses of the host of type host. They shall be defined as a comma-separated list of IP addresses enclosed with square brackets and following the host identifier.                                                                                                                                                                                                                                                                                                                                                              |
| -naHosts     | Specifies the comma-separated list of identifiers of hosts without access. Optionally, it's allowed to select the IP addresses of the host of type host. They shall be defined as a comma-separated list of IP addresses enclosed with square brackets and following the host identifier.                                                                                                                                                                                                                                                                                                                                                                     |
| -secEnforced | Specifies the minimal security option that must be provided by a client for the NFS mount operation. Valid values are (from least secure to most secure): <ul style="list-style-type: none"> <li>sys — Also known as AUTH_SYS security. This indicates there is no server-side authentication. When secure NFS is not configured on a NAS server, this is the default value.</li> <li>krb5 — Kerberos v5 authentication. This is the default value when secure NFS is configured on the NAS server.</li> <li>krb5i — Kerberos v5 authentication and integrity.</li> <li>krb5p — Kerberos v5 authentication and integrity, with encryption enabled.</li> </ul> |

## Example

The following command takes a snapshot of a file system with these settings:

- Name is NFSshare.
- Description is "My share."
- Snapshot ID is SNAP\_1.
- Path is /.
- Read-only hosts are Host\_1 and Host\_2.
- Read/write host is Host\_3.

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /prot/snap/nfs create -name NFSshare -
descr "My share" -snap SNAP_1 -path / -roHosts "Host_1, Host_2" -rwHosts "Host_3"
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection
```

```
ID = nfs_1
Operation completed successfully.
```

## View snapshot NFS shares

Lists the existing snapshot NFS shares.

### Format

```
/prot/snap/nfs [{-id <value> | -name <value> | -snap <value> | -snapName <value>}] show
```

## Object qualifier

| Qualifier | Description                                                                                                |
|-----------|------------------------------------------------------------------------------------------------------------|
| -id       | ID of the NFS share.                                                                                       |
| -name     | Name of the NFS share.                                                                                     |
| -snap     | ID of the parent snapshot. The list of shares associated with the identified snapshot will be displayed.   |
| -snapName | Name of the parent snapshot. The list of shares associated with the identified snapshot will be displayed. |

## Example

```
uemcli /prot/snap/nfs show -detail
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

1: ID = nfs_2
 Name = Share_2012-08-24 16:05_00
 Description =
 Snapshot = app_1_sg_1
 Local path = /group.app_1_sg_1.fs.fs_1_wckp
 Export path = 10.64.76.120:/Share_2012-08-24 16:05_00
 Default access = na
 No access hosts =
 Read-only hosts = 1014[10.192.168.5,10.192.168.6], 1015[10.192.168.9]
 Read/write hosts = 1016[10.244.245.0/255.255.255.0]
 Root hosts =
 Creation time = 2012-08-24 12:18:22
 Last modified time = 2012-08-24 12:18:22
 Role = production
 Minimum security = krb5
```

## Set snapshot NFS share

Modifies an existing snapshot NFS share.

## Format

```
/prot/snap/nfs {-id <value> | -name <value>} set [-async] [-descr <value>] [-defAccess {ro | rw | root | na}] [-roHosts <value>] [-rwHosts <value>] [-rootHosts <value>] [-naHosts <value>] [-minSecurity {sys | krb5 | krb5i | krb5p}]
```

## Object qualifier

| Qualifier | Description                     |
|-----------|---------------------------------|
| -id       | ID of the snapshot NFS share.   |
| -name     | Name of the snapshot NFS share. |

## Action qualifier

| Qualifier | Description                             |
|-----------|-----------------------------------------|
| -async    | Run the operation in asynchronous mode. |

| Qualifier    | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|--------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| -descr       | Type the description of the share.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| -defAccess   | Specifies the new user description of the share. Valid values are: <ul style="list-style-type: none"> <li>• ro—Read-only access</li> <li>• rw—Read/write access</li> <li>• root—Root access</li> <li>• na—No access</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                |
| -roHosts     | Specifies the comma-separated list of identifiers of hosts allowed to read. Optionally, it's allowed to select the IP addresses of the host of type host. They shall be defined as a comma-separated list of IP addresses enclosed with square brackets and following the host identifier.                                                                                                                                                                                                                                                                                                                                                                    |
| -rwHosts     | Specifies the comma-separated list of identifiers of hosts allowed to read and write. Optionally, it's allowed to select the IP addresses of the host of type host. They shall be defined as a comma-separated list of IP addresses enclosed with square brackets and following the host identifier.                                                                                                                                                                                                                                                                                                                                                          |
| -rootHosts   | Specifies the comma-separated list of identifiers of hosts with root permissions. Optionally, it's allowed to select the IP addresses of the host of type host. They shall be defined as a comma-separated list of IP addresses enclosed with square brackets and following the host identifier.                                                                                                                                                                                                                                                                                                                                                              |
| -naHosts     | Specifies the comma-separated list of identifiers of hosts without access. Optionally, it's allowed to select the IP addresses of the host of type host. They shall be defined as a comma-separated list of IP addresses enclosed with square brackets and following the host identifier.                                                                                                                                                                                                                                                                                                                                                                     |
| -minSecurity | Specifies the minimal security option that must be provided by a client for the NFS mount operation. Valid values are (from least secure to most secure): <ul style="list-style-type: none"> <li>• sys—Also known as AUTH_SYS security. This indicates there is no server-side authentication. When secure NFS is not configured on a NAS server, this is the default value.</li> <li>• krb5—Kerberos v5 authentication. This is the default value when secure NFS is configured on the NAS server.</li> <li>• krb5i—Kerberos v5 authentication and integrity.</li> <li>• krb5p—Kerberos v5 authentication and integrity, with encryption enabled.</li> </ul> |

## Example


```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /prot/snap/nfs -id NFS_1 set -descr "My share"
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection
```

```
ID = NFS_1
Operation completed successfully.
```

## Delete snapshot NFS shares

Delete (destroy) a snapshot NFS share.

 **NOTE:** Once you delete a snapshot share, you can no longer recover data from it or restore a storage resource to it.

## Format

```
/prot/snap/nfs {-id <value> | -name <value>} delete [-async]
```

## Object qualifier

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

## Action qualifier

| Qualifier | Description                             |
|-----------|-----------------------------------------|
| -async    | Run the operation in asynchronous mode. |

## Example

The following command deletes snapshot nfs\_1:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /prot/snap/nfs -id nfs_1 delete
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection
Operation completed successfully.
```

# Manage snapshot CIFS shares

The following table lists the attributes for snapshot CIFS (SMB) shares.

**Table 125. Snapshot CIFS share attributes**

| Attribute            | Description                                                                                                                                                                                                                                                                                          |
|----------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ID                   | ID of the snapshot CIFS share.                                                                                                                                                                                                                                                                       |
| Name                 | Name of the snapshot CIFS share.                                                                                                                                                                                                                                                                     |
| Description          | Description of the snapshot CIFS share.                                                                                                                                                                                                                                                              |
| Snapshot             | Parent snapshot (see <a href="#">Manage snapshots</a> on page 435.)                                                                                                                                                                                                                                  |
| Local path           | Local path to be exported.                                                                                                                                                                                                                                                                           |
| Export path          | Export path to the share.                                                                                                                                                                                                                                                                            |
| Creation time        | Creation time of the share.                                                                                                                                                                                                                                                                          |
| Last modified time   | Last modified time of the share.                                                                                                                                                                                                                                                                     |
| Availability enabled | Continuous availability state.                                                                                                                                                                                                                                                                       |
| Encryption enabled   | CIFS encryption state.                                                                                                                                                                                                                                                                               |
| Umask                | Indicates the default Unix umask for new files created on the share. If not specified, the umask defaults to 022.                                                                                                                                                                                    |
| ABE enabled          | Indicates whether an Access-Based Enumeration (ABE) filter is enabled. Valid values include: <ul style="list-style-type: none"><li>• yes — Filters the list of available files and folders on a share to include only those that the requesting user has access to.</li><li>• no (default)</li></ul> |

**Table 125. Snapshot CIFS share attributes (continued)**

| Attribute            | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|----------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Dfs enabled          | Indicates whether Distributed File System (DFS) is enabled. Valid values include: <ul style="list-style-type: none"> <li>yes — Allows administrators to group shared folders located on different shares by transparently connecting them to one or more DFS namespaces.</li> <li>no</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                      |
| BranchCache enabled  | Indicates whether BranchCache is enabled. Valid values include: <ul style="list-style-type: none"> <li>yes — Copies content from the main office or hosted cloud content servers and caches the content at branch office locations. This allows client computers at branch offices to access content locally rather than over the WAN.</li> <li>no (default)</li> </ul>                                                                                                                                                                                                                                                                                                                                              |
| Offline availability | Indicates whether Offline availability is enabled. When enabled, users can use this feature on their computers to work with shared folders stored on a server, even when they are not connected to the network. Valid values include: <ul style="list-style-type: none"> <li>none — Prevents clients from storing documents and programs in offline cache (default)</li> <li>documents — All files that clients open will be available offline.</li> <li>programs — All programs and files that clients open will be available offline. Programs and files will preferably open from offline cache, even when connected to the network.</li> <li>manual — Only specified files will be available offline.</li> </ul> |

## Create a CIFS snapshot

Create a snapshot CIFS (SMB) share.

### Format

```
/prot/snap/cifs create [-async] -name <value> [-descr <value>] -snap <value> -path <value>
[-enableContinuousAvailability {yes | no}] [-enableCIFSEncryption {yes | no}] [-umask
<value>] [-enableABE {yes | no}] [-enableBranchCache {yes | no}] [-offlineAvailability
{none | documents | programs | manual}]
```

### Action qualifier

| Qualifier                     | Description                                             |
|-------------------------------|---------------------------------------------------------|
| -async                        | Run the operation in asynchronous mode.                 |
| -name                         | Type the username of the share.                         |
| -descr                        | Type the description of the share.                      |
| -snap                         | Type the snapshot to associate the share with.          |
| -path                         | Type the path on which to mount the shared file system. |
| -enableContinuousAvailability | Specify whether continuous availability is enabled.     |
| -enableCIFSEncryption         | Specify whether CIFS encryption is enabled.             |

| Qualifier            | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|----------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| -umask               | Type the default Unix umask for new files created on the share.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| -enableABE           | Specify if Access-based Enumeration is enabled. Valid values are: <ul style="list-style-type: none"> <li>yes</li> <li>no (default)</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                   |
| -enableBranchCache   | Specify if BranchCache is enabled. Valid values are: <ul style="list-style-type: none"> <li>yes</li> <li>no (default)</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                |
| -offlineAvailability | Specify the type of offline availability. Valid values are: <ul style="list-style-type: none"> <li>none (default) — Prevents clients from storing documents and programs in offline cache.</li> <li>documents — Allows all files that clients open to be available offline.</li> <li>programs — Allows all programs and files that clients open to be available offline. Programs and files will open from offline cache, even when connected to the network.</li> <li>manual — Allows only specified files to be available offline.</li> </ul> |

## Example

The following command takes a snapshot of a file system with these settings:

- Name is CIFSshare.
- Description is "My share."
- Snapshot is "cifssnap1"
- Path is /.

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /prot/snap/cifs create -name CIFSshare -descr "My share" -snap cifssnap1 -path /
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection
```

```
ID = cifs_1
Operation completed successfully.
```

## View snapshot CIFS shares

Lists the existing snapshot CIFS (SMB) shares.

### Format

```
/prot/snap/cifs [{-id <value> | -name <value> | -snap <value> | -snapName <value>}] show
```

### Object qualifier

| Qualifier | Description                                                                                               |
|-----------|-----------------------------------------------------------------------------------------------------------|
| -id       | ID of the CIFS share.                                                                                     |
| -name     | Name of the CIFS share.                                                                                   |
| -snap     | ID of the parent snapshot. The list of shares associated with the identified snapshot will be displayed.  |
| -snapName | Name of the parent snapshot. The list of shares associated with the identified snapshot will be displayed |

## Example

```
uemcli /prot/snap/cifs show
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

1: ID = cifs_2
 Name = Share_2012-08-24 16:05_00
 Description =
 Snapshot = app_1_sg_1
 Local path = /group.app_1_sg_1.fs.fs_1_wckp
 Export path = 10.64.76.120:/Share_2012-08-24 16:05_00
 Default access = na
 No access hosts =
 Read-only hosts = 1014[10.192.168.5,10.192.168.6], 1015[10.192.168.9]
 Read/write hosts = 1016[10.244.245.0/255.255.255.0]
 Root hosts =
 Creation time = 2012-08-24 12:18:22
 Last modified time = 2012-08-24 12:18:22
```

## Set snapshot CIFS share

Modifies an existing snapshot CIFS (SMB) share.

### Format

```
/prot/snap/cifs {-id <value> | -name <value>} set [-async] [-descr <value>] [-enableContinuousAvailability {yes | no}] [-enableCIFSEncryption {yes | no}] [-umask <value>] [-enableABE {yes | no}] [-enableBranchCache {yes | no}] [-offlineAvailability {none | documents | programs | manual}]
```

### Object qualifier

| Qualifier | Description                      |
|-----------|----------------------------------|
| -id       | ID of the snapshot CIFS share.   |
| -name     | Name of the snapshot CIFS share. |

### Action qualifier

| Qualifier                     | Description                                                                                                                                |
|-------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------|
| -async                        | Run the operation in asynchronous mode.                                                                                                    |
| -desc                         | Specifies the new user description of the share.                                                                                           |
| -enableContinuousAvailability | Specify whether continuous availability is enabled.                                                                                        |
| -enableCIFSEncryption         | Specify whether CIFS encryption is enabled.                                                                                                |
| -umask                        | Type the default Unix umask for new files created on the share.                                                                            |
| -enableABE                    | Specify if Access-Based Enumeration (ABE) is enabled. Valid values are: <ul style="list-style-type: none"><li>• yes</li><li>• no</li></ul> |
| -enableBranchCache            | Specify if BranchCache is enabled. Valid values are: <ul style="list-style-type: none"><li>• yes</li></ul>                                 |

| Qualifier            | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|----------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                      | <ul style="list-style-type: none"> <li>no</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| -offlineAvailability | Specify the type of offline availability. Valid values are: <ul style="list-style-type: none"> <li>none—Prevents clients from storing documents and programs in offline cache.</li> <li>documents—Allows all files that clients open to be available offline.</li> <li>programs—Allows all programs and files that clients open to be available offline. Programs and files will open from offline cache, even when connected to the network.</li> <li>manual—Allows only specified files to be available offline.</li> </ul> |

## Example


```
uemcli /prot/snap/cifs -id cifs_1 set -descr "My share"
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

ID = cifs_1
Operation completed successfully.
```

## Delete snapshot CIFS shares

Delete (destroy) a snapshot CIFS (SMB) share.

 **NOTE:** Once you delete a snapshot share, you can no longer recover data from it or restore a storage resource to it.

## Format

```
/prot/snap/cifs {-id <value> | -name <value>} delete [-async]
```

## Object qualifier

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

## Action qualifier

| Qualifier | Description                             |
|-----------|-----------------------------------------|
| -async    | Run the operation in asynchronous mode. |

## Example

The following command deletes snapshot cif\_1:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /prot/snap/cifs -id smb_1 delete
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection
```



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.


Each replication session is identified by an ID. The Unisphere online help provides more details about storage replication.

It is important to note that when replicating from a Unity system running a later OE version (for example, OE 4.1.x) to a Unity system running an older version (for example, OE 4.0.x), you cannot have new OE version features enabled on the source.

 **NOTE:** At any given point in time, only one command is supported on a replication session. Before running a new command, ensure that you wait for the existing action on the replication session to complete.

The following table lists the attributes for replication sessions:

**Table 126. Replication session attributes**

| Attribute            | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|----------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ID                   | ID of the session.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Name                 | Name of the replication session.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Session type         | Storage type of the session. Valid values are: <ul style="list-style-type: none"><li>• lun</li><li>• block</li><li>• file</li><li>• nas server</li></ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Synchronization type | Type of synchronization. Valid values are: <ul style="list-style-type: none"><li>• auto—Data is replicated automatically in order to maintain the desired Recovery Point Objective (RPO).</li><li>• manual—Data will only be replicated when manually initiated.</li><li>• sync—Data is synchronously replicated with RPO=0.</li></ul> <p> <b>NOTE:</b> For asynchronous replication, the potential for data loss increases as the RPO 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.</p> |
| RPO                  | Recovery Point Objective (RPO) interval for automatic synchronization. For synchronous replication, the RPO is set to 0 automatically.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Resource type        | Type of storage resource to which the replication session is applied. Valid values are: <ul style="list-style-type: none"><li>• LUN</li><li>• LUN group</li><li>• File System</li><li>• VMware VMFS</li><li>• VMware NFS</li><li>• NAS Server</li></ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Sync State           | Additional state of the replication session, specific to the replication mode. <ul style="list-style-type: none"><li>• For asynchronous replication, valid values are:<ul style="list-style-type: none"><li>◦ idle— No active syncing.</li><li>◦ manual— User initiated syncing.</li></ul></li></ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |

**Table 126. Replication session attributes (continued)**

| Attribute          | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|--------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                    | <ul style="list-style-type: none"> <li>o <code>auto syncing</code>— System initiated syncing.</li> <li>• For synchronous replication, valid values are: <ul style="list-style-type: none"> <li>o <code>unknown</code>—Unknown sync state.</li> <li>o <code>out of sync</code>—Destination is out of sync with the source.</li> <li>o <code>in sync</code>—Destination is an exact copy of the source.</li> <li>o <code>consistent</code>—Destination is a point in time copy of the source.</li> <li>o <code>syncing</code>—System initiated syncing.</li> <li>o <code>inconsistent</code>—Destination is not a point in time copy of the source.</li> </ul> </li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Health state       | <p>Health state of the session. Valid values are:</p> <ul style="list-style-type: none"> <li>• <code>Unknown</code>—Session health cannot be determined.</li> <li>• <code>OK</code>—Session is operating normally.</li> <li>• <code>Degraded/Warning</code>—An error has caused one or more of the following: <ul style="list-style-type: none"> <li>o Session has been paused.</li> <li>o 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.</li> <li>o Session is syncing.</li> </ul> </li> <li>• <code>Minor failure</code>—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>• <code>Critical failure</code>— Session has encountered an error that has halted the session.</li> </ul> <p><b>i NOTE:</b> If the replication session is in an error state, in addition to resolving the issue (for example, destination pool out of space), try pausing, and then resuming the replication session. If the problem persists, delete and then create the replication session again.</p> |
| Health details     | Additional health information.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| Operational status | <p>Operational status of the session. The operational status code appears in parentheses.</p> <ul style="list-style-type: none"> <li>• <code>Unknown (0x0)</code></li> <li>• <code>Non Recoverable Error (0x7)</code></li> <li>• <code>Lost Communication (0xd)</code></li> <li>• <code>Failed Over with Sync (0x8400)</code></li> <li>• <code>Failed Over (0x8401)</code></li> <li>• <code>Manual Syncing (0x8402)</code></li> <li>• <code>Paused (0x8403)</code></li> <li>• <code>Idle (0x8404)</code></li> <li>• <code>Auto Sync Configured (0x8405)</code></li> <li>• <code>Destination Extend Failed Not Syncing (0x840B)</code></li> <li>• <code>Destination Extend In Progress (0x840C)</code></li> <li>• <code>Active (0x840D)</code></li> <li>• <code>Lost Sync Communication (0x840E)</code></li> <li>• <code>Syncing (0x8411)</code></li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Source status      | <p>Status of the source storage resource in the session. Valid values are:</p> <ul style="list-style-type: none"> <li>• <code>Unknown</code>—Source status is unknown.</li> <li>• <code>OK</code>—Source is operating normally.</li> <li>• <code>Paused</code>—Replication session for the source is currently paused.</li> <li>• <code>Fatal replication issue</code>—Source has experienced a critical error and the replication session has stopped. Delete the replication session and re-create it.</li> <li>• <code>Lost communication</code>—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</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |

**Table 126. Replication session attributes (continued)**

| Attribute          | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|--------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                    | <p>between the systems. A change in the network configuration on either side could also interrupt communication.</p> <ul style="list-style-type: none"> <li>• <b>Failed over</b>—The replication session has failed over to the destination site. In a failed over state, the destination object is read/write. When communication is reestablished between the source and destination, the source is shown as Restricted Replication Access = Yes. To resume operations on the source site, the replication session needs to be failed back.</li> <li>• <b>Switched over</b>—The replication session has switched over to the source site. In a switched over state, the source object is read/write. When communication is reestablished between the source and destination, the destination is shown as Restricted Replication Access = Yes. To resume operations on the destination site, the replication session needs to be failed over.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Destination status | <p>Status of the destination storage resource in the session. Valid values are:</p> <ul style="list-style-type: none"> <li>• <b>Unknown</b>—Status of the destination resource is unknown.</li> <li>• <b>OK</b>—Destination resource is operating normally.</li> <li>• <b>Paused</b>—Replication session for destination resource is currently paused.</li> <li>• <b>Fatal replication issue</b>—Destination has experienced a critical error and the replication session has stopped. Delete the replication session and re-create it.</li> <li>• <b>Lost communication</b>—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>• <b>Failed over</b>—The replication session has failed over to the destination site. In a failed over state, the destination object is read/write. When communication is reestablished between the source and destination, the source is shown as Restricted Replication Access = Yes. To resume operations on the source site, the replication session needs to be failed back.</li> <li>• <b>Switched over</b>—The replication session has switched over to the source site. In a switched over state, the source object is read/write. When communication is reestablished between the source and destination, the destination is shown as Restricted Replication Access = Yes. To resume operations on the destination site, the replication session needs to be failed over.</li> </ul> |
| Network status     | <p>Status of the network connection. Valid values are:</p> <ul style="list-style-type: none"> <li>• <b>Unknown</b>—Network status is currently unknown. If you continue to see this value, check the network connections.</li> <li>• <b>OK</b>—Network connection is operating normally.</li> <li>• <b>Lost Communication</b>—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 (lost IP) between the systems. A change in the network configuration on either side could also interrupt communication.</li> <li>• <b>Lost Sync Communication</b>—Fiber Channel communication with the synchronous replication remote system has been lost. It is likely that the Fiber Channel connection has encountered issues.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Destination type   | <p>Type of destination used in the session. Valid values are:</p> <ul style="list-style-type: none"> <li>• <b>local</b>—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>• <b>remote</b>—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 | <p>For remote sessions, the ID of the remote system on which the data is replicated.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| Local role         | <p>The local system role. Valid values are:</p> <ul style="list-style-type: none"> <li>• <b>Unknown</b>—Status of the local system is unknown.</li> <li>• <b>Source</b>—Resource on the local system is replicated to the remote system.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |

**Table 126. Replication session attributes (continued)**

| Attribute                         | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|-----------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                   | <ul style="list-style-type: none"> <li>• <b>Destination</b>—Resource on the local system is the replication destination of the resource on the remote system.</li> <li>• <b>Loopback</b>—Resources participating in the replication session are located on the same storage system.</li> <li>• <b>Local</b>—Resources participating in the replication session are located on the different storage processors of the local system.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| Source resource                   | ID of the storage resource that is the source of the session. The source can be local or remote.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Source SP A interface             | ID of the interface on the SPA of the source system for the replication.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Source SP B interface             | ID of the interface on the SPB of the source system for the replication.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Destination resource              | ID of the storage resource on which the data is replicated.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Destination SP A interface        | ID of the interface on the SPA of the destination system for the replication.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Destination SP B interface        | ID of the interface on the SPB of the destination system for the replication.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Time of last sync                 | Date and time of the last replication synchronization.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Sync status                       | <p>Percentage of the replication synchronization that has completed and the amount of time remaining.</p> <p><b>i NOTE:</b> For synchronous replication, the percentage is reported when the replication is in the Syncing state.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Sync transfer rate                | <p>Synchronization transfer rate when the session is in the syncing state. For multi-LUN applications there is a comma-separated list of values.</p> <p><b>i NOTE:</b> This attribute is valid for asynchronous replications only.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Sync transfer size remaining      | <p>Remaining size to be transferred during synchronization. For multi-LUN applications there is a comma-separated list of values.</p> <p><b>i NOTE:</b> This attribute is valid for asynchronous replications only.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Previous transfer rate            | <p>Previous average transfer rate for the replication session.</p> <p><b>i NOTE:</b> This attribute is valid for asynchronous replications only.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Average transfer rate             | <p>Average transfer rate for the replication session.</p> <p><b>i NOTE:</b> This attribute is valid for asynchronous replications only.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Element pairs                     | For consistency group and VMware VMFS datastore replications, the LUN element pairs within the replication.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Hourly snapshot keep for          | <p>Amount of time to keep replicated hourly snapshots on the destination. Output can be:</p> <ul style="list-style-type: none"> <li>• Blank when scheduled snapshots are not replicated.</li> <li>• <b>&lt;value&gt;&lt;qualifier&gt;</b>—When a retention duration is specified, where: <ul style="list-style-type: none"> <li>◦ <b>value</b>—An integer value. If the <b>qualifier</b> is h (hours), the valid range is from 1 to 42840. If the <b>qualifier</b> is d (days), the valid range is from 1 to 1785.</li> <li>◦ <b>qualifier</b>—A value qualifier. The valid values are: <ul style="list-style-type: none"> <li>▪ h (hours)</li> <li>▪ d (days)</li> </ul> </li> </ul> </li> <li>• <b>Forever</b>—When <b>-keepFor</b> value is not specified and allow auto-delete is requested</li> <li>• <b>Same as source</b>—Keep the destination retention policy the same as the source retention policy</li> </ul> <p><b>i NOTE:</b> This attribute is valid for asynchronous replications only.</p> |
| Hourly snapshot allow auto-delete | Whether or not the destination pool's auto-delete policy allows replicated hourly snapshots on the destination to be deleted. Output can be:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |

**Table 126. Replication session attributes (continued)**

| Attribute                                                                         | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|-----------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                                   | <ul style="list-style-type: none"> <li>Blank when scheduled snapshots are not replicated.</li> <li>Same as source—Keep the destination retention policy the same as the source retention policy</li> <li>yes—When <code>-allowAutoDelete</code> is set</li> <li>no—When <code>-keepFor</code> is set</li> </ul> <p><b>NOTE:</b> This attribute is valid for asynchronous replications only.</p>                                                                                                                                                                                                                                                                                                                      |
| Daily snapshot keep for                                                           | <p>Amount of time to keep replicated daily snapshots on the destination. Output can be:</p> <ul style="list-style-type: none"> <li>Blank when scheduled snapshots are not replicated.</li> <li>value—An integer value. If the <i>qualifier</i> is h (hours), the valid range is from 1 to 42840. If the <i>qualifier</i> is d (days), the valid range is from 1 to 1785.</li> <li>qualifier—A value qualifier. The valid values are: <ul style="list-style-type: none"> <li>h (hours)</li> <li>d (days)</li> </ul> </li> <li>Same as source—Keep the destination retention policy the same as the source retention policy</li> </ul> <p><b>NOTE:</b> This attribute is valid for asynchronous replications only.</p> |
| Daily snapshot allow auto-delete                                                  | <p>Whether or not the destination pool's auto-delete policy allows the replicated daily snapshots on the destination to be deleted. Output can be:</p> <ul style="list-style-type: none"> <li>Blank when scheduled snapshots are not replicated.</li> <li>Same as source—Keep the destination retention policy the same as the source retention policy</li> <li>yes—When <code>-allowAutoDelete</code> is set</li> <li>no—When <code>-keepFor</code> is set</li> </ul> <p><b>NOTE:</b> This attribute is valid for asynchronous replications only.</p>                                                                                                                                                               |
| Allow Async Snap Replication (file system asynchronous replication sessions only) | <p>Indicates whether or not to allow snap replication in asynchronous replication sessions. Values are:</p> <ul style="list-style-type: none"> <li>yes--Allow snap replication in asynchronous sessions.</li> <li>no--Disallow snap replication in asynchronous sessions.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                 |

## Create replication sessions

Create a replication session.

- NOTE:** Snapshots that have been created and attached as well as read/write (share) snapshots (as opposed to read-only checkpoint snapshots) are not eligible for replication. Only unattached (read-only) snapshots are eligible for replication. For asynchronous replication, you can replicate existing snapshots and snapshots created from snapshot schedules. For synchronous file replication, you cannot replicate existing snapshots or snapshots created from snapshot schedules. You can only replicate those snapshots and snapshots created from snapshot schedules after you have established the synchronous replication session and it is Active.
- NOTE:** On a NAS server protected by replication, you must create a replication session for each file system on it. Otherwise, file system related configurations like shares and exports may be lost after a NAS server replication session failover.
- NOTE:** To do snapshot replication from a source system running OE version 4.0, 4.1, 4.2, 4.3, or 4.4 to a destination system running OE version 5.x, requires upgrading the source system to OE version 4.5 first. Upgrading to OE version 4.5 is not required but recommended if you want to do LUN or file system replication from OE version 4.0, 4.1, 4.2, 4.3, or 4.4 to OE version 5.x without any snapshot replication.

## Prerequisites




Before creating a replication session, complete the following configuration tasks:








- Create the storage resource that provides the replication source.
- For local replication, create a replication destination on a local system.
- For remote replication, create a replication connection to a remote system, and create a replication destination on that remote system.
- For asynchronous replication in a coexisting asynchronous and synchronous replication with one source resource topology, create the asynchronous replication destination NAS server with both the `-replDest` and the `-backupOnly` attributes set to **yes**. These attributes must be set to **yes** on the asynchronous replication destination NAS server when the source NAS server is synchronous replicated; otherwise, the asynchronous replication session cannot be created.





## Format

```
/prot/rep/session create [-async] -srcRes <value> [-srcSPAInterface <value>] [-srcSPBInterface <value>] -dstType {local | remote} -dstSys <value> -dstRes <value> [-dstSPAInterface <value>] [-dstSPBInterface <value>] [-name <value>] [-elementPairs <value>] [-syncType {manual [-autoInitiate {yes | no}] | auto [-rpo <value>]}] [-replicateHourlySnaps {yes [{-keepSameAsSource | -keepFor <value> | -allowAutoDelete}] | no}] [-replicateDailySnaps {yes [{-keepSameAsSource | -keepFor <value> | -allowAutoDelete}] | no}] [-replicateExistingSnaps] [-allowAsyncSnapReplication {yes | no}]
```

## Action qualifiers

| Qualifier                     | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|-------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <code>-async</code>           | Run an action in asynchronous mode.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <code>-srcRes</code>          | Type the ID of the storage resource to use as the source.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <code>-srcSPAInterface</code> | Type the ID of the interface on the SPA of the source system for the replication.<br> <b>NOTE:</b> This qualifier is used for asynchronous replications on remote systems only. If the qualifier is not specified, the system identifies the interface automatically.                                                                                                                                                                                                                                                            |
| <code>-srcSPBInterface</code> | Type the ID of the interface on the SPB of the source system for the replication.<br> <b>NOTE:</b> This qualifier is used for asynchronous replications on remote systems only. If the qualifier is not specified, the system identifies the interface automatically.                                                                                                                                                                                                                                                            |
| <code>-dstType</code>         | Specify the type of destination. Valid values are: <ul style="list-style-type: none"><li>• <code>local</code>—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>• <code>remote</code>—Maintain a full copy of the storage resource on a remote system by transferring the data over the network.</li></ul> 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. |
| <code>-dstSys</code>          | For remote replication, type the ID of the destination system. <a href="#">View settings for remote storage systems</a> on page 254 explains how to view the IDs of the remote system configuration on the local system.                                                                                                                                                                                                                                                                                                                                                                                            |
| <code>-dstRes</code>          | Type the ID of the destination storage resource.<br> <b>NOTE:</b> To get the proper ID in the case of remote replication, you should use a command that list resources on a local machine with the <code>-remSys</code> qualifier. For example: <ul style="list-style-type: none"><li>• <code>uemcli /stor/prov/sf/res -remSys &lt;value&gt; show</code></li><li>• <code>uemcli /stor/prov/iscsi/res -remSys &lt;value&gt; show</code></li><li>• <code>uemcli /stor/prov/vmware/nfs -remSys &lt;value&gt; show</code></li></ul>  |
| <code>-dstSPAInterface</code> | Type the ID of the interface on the SPA of the destination system for the replication.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |

| Qualifier             | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|-----------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                       | <p> <b>NOTE:</b> This qualifier is used for asynchronous replications on remote systems only. If the qualifier is not specified, the system identifies the interface automatically.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| -dstSPBInterface      | <p>Type the ID of the interface on the SPB of the destination system for the replication.</p> <p> <b>NOTE:</b> This qualifier is used for asynchronous replications on remote systems only. If the qualifier is not specified, the system identifies the interface automatically.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| -syncType             | <p>Specify how the source and destination will synchronize. Valid values are:</p> <ul style="list-style-type: none"> <li>• <code>auto</code>—Data is replicated automatically in order to maintain the desired Recovery Point Objective (RPO).</li> <li>• <code>manual</code>—Data will only be replicated when manually initiated.</li> </ul> <p> <b>NOTE:</b></p> <p>This qualifier is used for asynchronous replications only.</p> <p>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.</p> |
| -autoInitiate         | <p>Specify whether the system will perform the first replication synchronization automatically. Valid values are:</p> <ul style="list-style-type: none"> <li>• <code>yes</code></li> <li>• <code>no</code></li> </ul> <p> <b>NOTE:</b> This qualifier is used for asynchronous replications only.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| -rpo                  | <p>Type the time interval for when the synchronization will run. Use the following format: <code>&lt;HH&gt;[:MM]</code></p> <p>where:</p> <ul style="list-style-type: none"> <li>• <code>HH</code>—Type the number of hours. Range is 00-24 hours (1 day).</li> <li>• <code>MM</code>—Type the number of minutes, in 5 minute increments. Range is 05 to 55.</li> </ul> <p>For synchronous replication, specify the value 0. Once set, the value cannot be reset from zero to non-zero or from non-zero to zero.</p>                                                                                                                                                                                                                                                                                                           |
| -replicateHourlySnaps | <p>Specify whether or not to mark hourly scheduled snapshots for replication. Valid values are:</p> <ul style="list-style-type: none"> <li>• <code>yes</code></li> <li>• <code>no</code></li> </ul> <p> <b>NOTE:</b> This qualifier is used for asynchronous replications only.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| -replicateDailySnaps  | <p>Specify whether or not to mark daily scheduled snapshots for replication. Valid values are:</p> <ul style="list-style-type: none"> <li>• <code>yes</code></li> <li>• <code>no</code></li> </ul> <p> <b>NOTE:</b> This qualifier is used for asynchronous replications only.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| -keepSameAsSource     | <p>Indicates whether or not to use the same retention policy (expiration time and auto-delete) of the source for the destination. This option propagates changes made to the source retention policy to the destination retention policy (from that point forward for newly created scheduled snapshots, old snapshots are left as is). No values are allowed.</p> <p>This option is enabled by default if <code>-keepFor</code> or <code>-allowAutoDelete</code> are not set.</p> <p> <b>NOTE:</b> This qualifier is used for asynchronous replications only.</p>                                                                                                                                                                          |
| -keepFor              | <p>Specifies the retention time after which the snapshot is deleted on the destination. The interval can be defined in days or hours. Use the following format:</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |

| Qualifier                  | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|----------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                            | <p>&lt;value&gt;&lt;qualifier&gt;</p> <p>where:</p> <ul style="list-style-type: none"> <li>• <i>value</i>—An integer value. If the <i>qualifier</i> is h (hours), the valid range is from 1 to 42840. If the <i>qualifier</i> is d (days), the valid range is from 1 to 1785.</li> <li>• <i>qualifier</i>—A value qualifier. The valid values are: <ul style="list-style-type: none"> <li>◦ h (hours)</li> <li>◦ d (days)</li> </ul> </li> </ul> <p> <b>NOTE:</b> This qualifier is used for asynchronous replications only.</p>                                                                                                                                                                                                                                                                                                                                  |
| -allowAutoDelete           | <p>Specify whether auto delete is allowed on the replicated copy of this snapshot or snapshot set. Valid values:</p> <ul style="list-style-type: none"> <li>• yes</li> <li>• no</li> </ul> <p> <b>NOTE:</b> This qualifier is used for asynchronous replications only.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| -replicateExistingSnaps    | <p>Indicates whether or not to replicate snapshots already existing on the source resource. This is a one-time option available during session creation that will replicate snapshots existing on the source at that moment in time. All eligible snapshots are replicated and have the source retention policy applied for the destination retention policy. For a snapshot to be eligible for this option, it must meet these 3 criteria:</p> <ul style="list-style-type: none"> <li>• The snapshot is created by either the user or a snapshot schedule.</li> <li>• The snapshot is read-only (file resource snapshot must be a checkpoint snapshot; block resource snapshot must not be attached).</li> <li>• The snapshot is not currently undergoing deletion.</li> </ul> <p> <b>NOTE:</b> This qualifier is used for asynchronous replications only.</p> |
| -allowAsyncSnapReplication | <p>Indicates whether or not to allow snapshot replication in asynchronous session. Restriction: For a storage resource, snap replication is allowed only in one of its asynchronous replication sessions. Valid values are:</p> <ul style="list-style-type: none"> <li>• <b>yes</b></li> <li>• <b>no</b></li> </ul> <p> <b>NOTE:</b> This qualifier is used for file system asynchronous replications only.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                 |

## Example

The following command creates a replication session with these settings:

- Source storage resource is file system RS\_1.
- Destination system type is remote.
- Remote destination system is RS\_2.
- Remote storage resource is file system LUN\_2.
- Synchronization type is automatic.
- RPO is 2 hours and 30 minutes.

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /prot/rep/session create -name REP1 -
srcRes RS_1 -dstType remote -dstSys RS_2 -dstRes LUN_2 -syncType auto -rpo 02h30m
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection
```

```
ID = 81604378625_FCNCH097274B3A_0000_81604378627_FCNCH097274B37_0000
Operation completed successfully.
```



## View replication sessions

View details about replication sessions. You can filter on the session ID.

 **NOTE:** The show action command explains how to change the output format.

### Format

```
/prot/rep/session [{-id <value> | -name <value> | -res <value>}] show
```

### Object qualifiers

| Qualifier | Description                                                                                    |
|-----------|------------------------------------------------------------------------------------------------|
| -id       | Type the ID of the replication session.                                                        |
| -name     | Type the name of the replication session.                                                      |
| -res      | Type the ID of a local storage resource on the system to view the sessions associated with it. |

### Example 1

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
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

1: ID =
42949672967_FNM00134400082_0000_42949672967_FNM00131800278_0000
 Name = REPl
 Session type = nas server
 Synchronization type = auto
 Resource type = NAS Server
 Destination type = remote
```

### Example 2

The following command displays all replication sessions on the system and their details:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /prot/rep/session show -detail
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

1: ID =
42949672967_FNM00134400082_0000_42949672967_FNM00131800278_0000
 Name = REPl
 Session type = nas server
 Synchronization type = auto
 RPO =
 Resource type = LUN
 Sync State = idle
 Health state = OK (5)
 Health details = "This replication session is operating
normally. No action is required."
 Operational status = Idle (0x8404)
 Source status = OK
 Destination status = OK
 Network status = OK
```

```

Destination type = local
Destination system = local
Local role = Local
Source resource = sv_1
Source SP-A interface = N/A
Source SP-B interface = N/A
Destination resource = sv_2
Destination SP-A interface = N/A
Destination SP-B interface = N/A
Time of last sync = N/A
Sync status =
Sync transfer rate = N/A
Sync transfer size remaining = 0
Previous transfer rate = N/A
Average transfer rate = N/A
Element pairs = N/A
Hourly snapshot keep for = 3h
Hourly snapshot allow auto-delete = no
Daily snapshot keep for = same as source
Daily snapshot allow auto-delete = same as source

```

## Change replication session settings

Change the settings for a replication session.

### Format

```




/prot/rep/session {-id <value> | -name <value>} set [-async] [-newName <value>]
[-srcSPAInterface <value>] [-dstSPAInterface <value>] [-srcSPBInterface <value>] [-dstSPBInterface <value>] [-syncType {manual | auto -rpo <value>}] [-replicateHourlySnaps {yes [{-keepSameAsSource | -keepFor <value> | -allowAutoDelete}] | no}] [-replicateDailySnaps {yes [{-keepSameAsSource | -keepFor <value> | -allowAutoDelete}] | no}] [-allowAsyncSnapReplication {yes | no}]

```




### Object qualifiers

| Qualifier | Description                                         |
|-----------|-----------------------------------------------------|
| -id       | Type the ID of the replication session to change.   |
| -name     | Type the name of the replication session to change. |

### Action qualifiers

| Qualifier        | Description                                                                                                                                                                                                                                                                                                                                                   |
|------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| -async           | Run an action in asynchronous mode.                                                                                                                                                                                                                                                                                                                           |
| -newName         | Type the new name of the replication session.                                                                                                                                                                                                                                                                                                                 |
| -srcSPAInterface | Type the ID of the interface on the SPA of the source system for the replication.<br> <b>NOTE:</b> This qualifier is used for asynchronous replications on remote systems only. If the qualifier is not specified, the system identifies the interface automatically.      |
| -srcSPBInterface | Type the ID of the interface on the SPB of the source system for the replication.<br> <b>NOTE:</b> This qualifier is used for asynchronous replications on remote systems only. If the qualifier is not specified, the system identifies the interface automatically.      |
| -dstSPAInterface | Type the ID of the interface on the SPA of the destination system for the replication.<br> <b>NOTE:</b> This qualifier is used for asynchronous replications on remote systems only. If the qualifier is not specified, the system identifies the interface automatically. |

| Qualifier             | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|-----------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| -dstSPBInterface      | Type the ID of the interface on the SPB of the destination system for the replication.<br><i>i</i> <b>NOTE:</b> This qualifier is used for asynchronous replications on remote systems only. If the qualifier is not specified, the system identifies the interface automatically.                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| -syncType             | Specify how the source and destination will synchronize. Valid values are: <ul style="list-style-type: none"> <li>• <code>auto</code>—Data is replicated automatically in order to maintain the desired Recovery Point Objective (RPO).</li> <li>• <code>manual</code>—Data will only be replicated when manually initiated.</li> </ul> <i>i</i> <b>NOTE:</b> This qualifier is used for asynchronous replications only.<br>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.                         |
| -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>• <code>HH</code>—Type the number of hours. Range is 00-24 hours (1 day).</li> <li>• <code>MM</code>—Type the number of minutes, in 5 minute increments. Range is 05 to 55.</li> </ul> <i>i</i> <b>NOTE:</b> For synchronous replication, specify the value 0. The value cannot be reset from zero to non-zero or from non-zero to zero.                                                                                                                                                                                                                        |
| -replicateHourlySnaps | Specify whether or not to mark hourly scheduled snapshots for replication. Valid values are: <ul style="list-style-type: none"> <li>• <code>yes</code></li> <li>• <code>no</code></li> </ul> <i>i</i> <b>NOTE:</b> This qualifier is used for asynchronous replications only.                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| -replicateDailySnaps  | Specify whether or not to mark daily scheduled snapshots for replication. Valid values are: <ul style="list-style-type: none"> <li>• <code>yes</code></li> <li>• <code>no</code></li> </ul> <i>i</i> <b>NOTE:</b> This qualifier is used for asynchronous replications only.                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| -keepSameAsSource     | Specify whether or not to use the same retention policy (expiration time and auto-delete) of the source for the destination. This option propagates changes made to the source retention policy to the destination retention policy (from that point forward for newly created scheduled snapshots, old snapshots are left as is). No values are allowed.<br><i>i</i> <b>NOTE:</b> This qualifier is used for asynchronous replications only.                                                                                                                                                                                                                                                                                                        |
| -keepFor              | Specify the retention time after which the snapshot is deleted on the destination. The interval can be defined in days or hours. Use the following format:<br><value><qualifier><br>where: <ul style="list-style-type: none"> <li>• <code>value</code>—An integer value. If the <code>qualifier</code> is <code>h</code> (hours), the valid range is from 1 to 42840. If the <code>qualifier</code> is <code>d</code> (days), the valid range is from 1 to 1785.</li> <li>• <code>qualifier</code>—A value qualifier. The valid values are: <ul style="list-style-type: none"> <li>◦ <code>h</code> (hours)</li> <li>◦ <code>d</code> (days)</li> </ul> </li> </ul> <i>i</i> <b>NOTE:</b> This qualifier is used for asynchronous replications only. |

| Qualifier                  | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|----------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| -allowAutoDelete           | <p> <b>NOTE:</b> Only valid when <b>-replicateHourlySnaps yes</b> or <b>-replicateDailySnaps yes</b>.</p> <p>Specify whether auto delete is allowed on the replicated copy of this snapshot or snapshot set. Valid values are:</p> <ul style="list-style-type: none"> <li>• yes</li> <li>• no</li> </ul> <p> <b>NOTE:</b> This qualifier is used for asynchronous replications only.</p> |
| -allowAsyncSnapReplication | <p>Indicates whether or not to allow snapshot replication in asynchronous session. Restriction: For a storage resource, snapshot replication is allowed only in one of its asynchronous replication sessions. Valid values are:</p> <ul style="list-style-type: none"> <li>• <b>yes</b></li> <li>• <b>no</b></li> </ul> <p> <b>NOTE:</b> This qualifier is used for file system asynchronous replications only and can only be modified when the session is paused.</p>   |

## Example

The following command changes the source interface and destination interface for replication session 81604378625\_FCNCH097274B3A\_0000\_81604378627\_FCNCH097274B37\_0000:

```
uemcli /prot/rep/session -id
81604378625_FCNCH097274B3A_0000_81604378627_FCNCH097274B37_0000 set -srcSPAInterface if_1 -
srcSPBInterface if_2 -dstSPAInterface if_3 -dstSPBInterface if_4
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection
```

```
ID = 81604378625_FCNCH097274B3A_0000_81604378627_FCNCH097274B37_0000
Operation completed successfully.
```

## Pause replication sessions

Pause a replication session.

### Format

```
/prot/rep/session {-id <value> | -name <value>} pause [-async]
```

### Object qualifiers

| Qualifier | Description                                            |
|-----------|--------------------------------------------------------|
| -id       | Type the ID of the replication session to be paused.   |
| -name     | Type the name of the replication session to be paused. |

### Action qualifiers

| Qualifier | Description                         |
|-----------|-------------------------------------|
| -async    | Run an action in asynchronous mode. |

## Example

The following command pauses replication session 81604378625\_FCNC097274B3A\_0000\_81604378627\_FCNC097274B37\_0000:

```
uemcli /prot/rep/session -id
81604378625_FCNC097274B3A_0000_81604378627_FCNC097274B37_0000 pause
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

Operation completed successfully.
```

## Resume replication sessions

Resumes an existing replication session.

### Format



```
/prot/rep/session {-id <value> | -name <value>} resume [-async] [-forceFullCopy]
[-srcSPAInterface <value>] [-dstSPAInterface <value>] [-srcSPBInterface <value>] [-
dstSPBInterface <value>] [-forceSyncData]
```

### Object qualifiers

| Qualifier | Description                                             |
|-----------|---------------------------------------------------------|
| -id       | Type the ID of the replication session to be resumed.   |
| -name     | Type the name of the replication session to be resumed. |

### Action qualifiers

| Qualifier        | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| -async           | Run an action in asynchronous mode.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| -forceFullCopy   | <p>Specifies to force a full synchronization during the resume operation.</p> <p><b>NOTE:</b></p> <ul style="list-style-type: none"><li>If there is no longer a common base for the source storage resource, a full synchronization is required. For such cases, ensure that you specify this qualifier. However, if the resume operation does find the common base, it uses the common base to do the delta synchronization rather than the full synchronization, regardless of this qualifier.</li><li>This qualifier is used for asynchronous replications only.</li></ul> |
| -srcSPAInterface | <p>Type the ID of the interface on the SPA of the source system for the replication.</p> <p><b>NOTE:</b> This qualifier is used for asynchronous replications on remote systems only. If the qualifier is not specified, the system identifies the interface automatically.</p>                                                                                                                                                                                                                                                                                               |
| -dstSPAInterface | <p>Type the ID of the interface on the SPA of the destination system for the replication.</p> <p><b>NOTE:</b> This qualifier is used for asynchronous replications on remote systems only. If the qualifier is not specified, the system identifies the interface automatically.</p>                                                                                                                                                                                                                                                                                          |
| -srcSPBInterface | <p>Type the ID of the interface on the SPB of the source system for the replication.</p> <p><b>NOTE:</b> This qualifier is used for asynchronous replications on remote systems only. If the qualifier is not specified, the system identifies the interface automatically.</p>                                                                                                                                                                                                                                                                                               |

| Qualifier        | Description                                                                                                                                                                                                                                                                                                                                                 |
|------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| -dstSPBInterface | Type the ID of the interface on the SPB of the destination system for the replication.<br> <b>NOTE:</b> This qualifier is used for asynchronous replications on remote systems only. If the qualifier is not specified, the system identifies the interface automatically. |
| -forceSyncData   | Specifies to force data transfer from the source system to the remote system even if the remote system has data not replicated from the source system.<br> <b>NOTE:</b> This qualifier is used for asynchronous replications only.                                         |

## Example

The following command resumes replication session 81604378625\_FCNCH097274B3A\_0000\_81604378627\_FCNCH097274B37\_0000:

```
uemcli /prot/rep/session -id 81604378625_FCNCH097274B3A_0000_81604378627_FCNCH097274B37_0000 resume
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

ID = 81604378625_FCNCH097274B3A_0000_81604378627_FCNCH097274B37_0000
Operation completed successfully.
```

## Manually synchronize replication sessions

Manually synchronize a replication session.

### Format

```
/prot/rep/session{-id <value> | -name <value>} sync [-async]
```

### Object qualifiers

| Qualifier | Description                                              |
|-----------|----------------------------------------------------------|
| -id       | Type the ID of the replication session to synchronize.   |
| -name     | Type the name of the replication session to synchronize. |

### Action qualifiers

| Qualifier | Description                         |
|-----------|-------------------------------------|
| -async    | Run an action in asynchronous mode. |

## 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
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection
```

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. Deleting the session from the source system automatically removes the destination and source replication sessions. This ensures that you do not have to manually delete the associated storage resources or NAS servers from the destination system.

**NOTE:** Once you delete a replication session, data from the source storage resource will no longer be replicated on the destination, leaving the data unprotected. When deleting a file system synchronous replication session, though the session is deleted, if the initial synchronization does not complete, the destination file system will run into an unrecoverable error. In this case, delete the destination file system.

### Format

```
/prot/rep/session {-id <value> | -name <value>} delete [-async]
```

### Object qualifiers

| Qualifier | Description                                         |
|-----------|-----------------------------------------------------|
| -id       | Type the ID of the replication session to delete.   |
| -name     | Type the name of the replication session to delete. |

### Action qualifiers

| Qualifier | Description                         |
|-----------|-------------------------------------|
| -async    | Run an action in asynchronous mode. |

### Example

The following command deletes replication session 81604378625\_FCNC097274B3A\_0000\_81604378627\_FCNC097274B37\_0000:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /prot/rep/session -id 81604378625_FCNC097274B3A_0000_81604378627_FCNC097274B37_0000 delete
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

Operation completed successfully.
```

## Fail over replication sessions

Run this command on the destination system to 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 system is read/write. To reestablish communication between the source and destination, fail back the session that has failed over. [Fail back replication sessions](#) on page 473 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 storage resource from read/write to read-only.

## Initiate a planned downtime

To initiate a planned downtime, run this command on the source system by specifying the `-sync` option with the value `yes`. When you fail over a replication session from the source system, the destination system is fully synchronized with the source to ensure that there is no data loss. The destination storage resource can be used for providing access to the host.

## Format

```
/prot/rep/session {-id <value> | -name <value>} failover [-async] [-sync {yes | no}] [-force]
```

## Object qualifiers

| Qualifier | Description                                            |
|-----------|--------------------------------------------------------|
| -id       | Type the ID of the replication session to fail over.   |
| -name     | Type the name of the replication session to fail over. |

## Action qualifiers

| Qualifier | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|-----------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| -async    | Run an action in asynchronous mode.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| -sync     | For an asynchronous replication session, specifies whether a synchronization needs to be performed before failing over the replication session. For a synchronous replication session, specifies whether to keep synchronization on the reversed direction after failing over the session. Valid values are: <ul style="list-style-type: none"><li>yes—For a planned failover. Can only be issued from the source system. Where <code>-sync</code> is not specified, this is the default value for a local replication session or session where <code>role=source</code>.</li><li>no—For an unplanned failover. Can only be issued from the destination system. Where <code>-sync</code> is not specified, this is the default value for a remote replication session or session where <code>role=destination</code>.</li></ul> <b>NOTE:</b> If the Network status=OK, the source system is probably OK. The command issued from the destination system without this option will fail. It is recommended to rerun the command using the <code>yes</code> option from the source system. However, in that case, the command issued from the destination system using the <code>no</code> option is still allowed. |
| -force    | Specifies whether to skip a pre-check operation on file systems of a NAS server when a replication failover operation is issued from the source NAS server. No values are allowed.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |

## Example

The following command performs a fail over of replication session 81604378625\_FCNC097274B3A\_0000\_81604378627\_FCNC097274B37\_0000:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /prot/rep/session -id 81604378625_FCNC097274B3A_0000_81604378627_FCNC097274B37_0000 failover
```

Storage system address: 10.0.0.1  
Storage system port: 443  
HTTPS connection

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.

 **NOTE:** Ensure that hosts do not write to the destination storage resource, which will become read-only.



### Format

```
/prot/rep/session {-id <value> | -name <value>} failback [-async] [-forceFullCopy] [-force] [-syncData {force | ignore}]
```

### Object qualifiers

| Qualifier | Description                                            |
|-----------|--------------------------------------------------------|
| -id       | Type the ID of the replication session to fail back.   |
| -name     | Type the name of the replication session to fail back. |

### Action qualifiers

| Qualifier      | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|----------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| -async         | Run an action in asynchronous mode.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| -forceFullCopy | <p>Specifies to force a full synchronization before the failback operation occurs.</p> <p> <b>NOTE:</b></p> <ul style="list-style-type: none"><li>• You may lose the common base on the source storage resource as a result of the event that caused the original failover. If there is no longer a common base for the source storage resource, a full synchronization is required. For such cases, ensure that you specify this qualifier. However, if the failback operation does find the common base, it uses the common base to do the delta synchronization rather than the full synchronization, regardless of this qualifier.</li><li>• This qualifier is used for asynchronous replications only.</li></ul> |
| -force         | Before failing back a NAS server synchronous replication session, it is checked whether its associated asynchronous file system replication sessions are all preserved when coexisting. When this qualifier is specified, that check is skipped.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| -syncData      | <p>Specifies the behavior of transferring data from the source system to the remote system. If the qualifier is not specified, the command will fail if the remote system has data not replicated from the source system. Valid values are:</p> <ul style="list-style-type: none"><li>• <b>force</b> – Force data transfer from the source system to the remote system, even if the remote system has out-of-sync data.</li><li>• <b>ignore</b> – Skip data transfer from the source system to the remote system. Just trigger the replication session reverse from the remote system to the source system.</li></ul> <p> <b>NOTE:</b> This qualifier is used for asynchronous replications only.</p>                 |

## Example

The following command performs a fail back of replication session 81604378625\_FCNC097274B3A\_0000\_81604378627\_FCNC097274B37\_0000:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /prot/rep/session -id 81604378625_FCNC097274B3A_0000_81604378627_FCNC097274B37_0000 failback
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

Operation completed successfully.
```

## Preserve asynchronous replication sessions

Initiates a preserve asynchronous replication sessions operation on a NAS server synchronous replication session. After a NAS server synchronous replication session fails over or fails back with its file system synchronous replication sessions, the asynchronous replication sessions will be switched to the new production site by the preserve asynchronous replication sessions operation.

### Format

```
/prot/rep/session {-id <value> | -name <value>} preserveAsync
```

### Object qualifiers

| Qualifier | Description                                                        |
|-----------|--------------------------------------------------------------------|
| -id       | Identifies the NAS server synchronous replication session.         |
| -name     | Identifies the NAS server synchronous replication session by name. |

## Example

The following command preserves asynchronous replication sessions for 81604378625\_FCNC097274B3A\_0000\_81604378627\_FCNC097274B37\_0000:

```
uemcli /prot/rep/session -id 81604378625_FCNC097274B3A_0000_81604378627_FCNC097274B37_0000 preserveAsync
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

Operation completed successfully.
```

## Manage virtual RecoverPoint appliance CHAP accounts

When configuring a virtual RecoverPoint appliance (RPA) to work with the storage system, you can optionally set up iSCSI interface authentication using the Challenge Handshake Authentication Protocol (CHAP). Two type of CHAP are supported:

- Incoming Forward CHAP – This is used by the storage system to authenticate the RPA. This CHAP is similar to the iSCSI CHAP account. For more information on configuring this CHAP, see [Manage iSCSI CHAP accounts for one-way CHAP authentication](#) on page 243.
- Outgoing Forward CHAP - This is used by the RPA to authenticate the storage system.

This section describes the attributes and commands that enable you to manage RPA CHAP accounts.

The following table lists the attributes for RPA CHAP accounts:

**Table 127. RPA CHAP attributes**

| Attribute         | Description                                                                                                                                                                                                                      |
|-------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Out username      | The outgoing CHAP user name.                                                                                                                                                                                                     |
| Out secret        | The outgoing CHAP secret (password).                                                                                                                                                                                             |
| Out secret format | The outgoing CHAP secret input format. Valid values are: <ul style="list-style-type: none"><li>• <code>ascii</code> — Secret in the ASCII format (default).</li><li>• <code>hex</code> — Secret in hexadecimal format.</li></ul> |

## View the RPA CHAP account

View the RPA CHAP account.

### Format

```
/remote/rpa/chap show
```

### Example

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

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

1: Out username = admin
```

## Change RPA CHAP account

Modify the RPA CHAP account.

### Format

```
/remote/rpa/chap set [-outUsername <value>] [{ -outSecret <value> | -outSecretSecure }
[-outSecretFormat {ascii|hex}]]
```

### Action qualifier

| Qualifier        | Description                                                                                                                                                                                                            |
|------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| -outUsername     | Type the outgoing CHAP user name.                                                                                                                                                                                      |
| -outSecret       | Type the outgoing CHAP secret (password). By default, the CHAP secret is an ASCII string that is 12 to 16 characters. Hexadecimal secrets are 12 to 16 pairs of data (24 to 32 characters).                            |
| -outSecretSecure | Type the outgoing CHAP secret in secure mode. You will be prompted separately to type the password.                                                                                                                    |
| -outSecretFormat | The outgoing CHAP secret input format. Valid values are: <ul style="list-style-type: none"><li>• <code>ascii</code> - Secret in the ASCII format.</li><li>• <code>hex</code> - Secret in hexadecimal format.</li></ul> |

Example

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /remote/rpa/chap set -outUsername admin
-outSecret abcdef123456

Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

Operation completed successfully.
```

Manage Data at Rest Encryption (physical deployments only)

**NOTE:** This feature may not be available in your implementation.

Table 128. Data at Rest Encryption attributes

| Attribute              | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Encryption mode        | Encryption mode. Valid values are: <ul style="list-style-type: none"><li>Unencrypted</li><li>Controller Based Encryption</li></ul>                                                                                                                                                                                                                                                                                                                                                                                 |
| Encryption status      | Status of the encryption process. Valid values are: <ul style="list-style-type: none"><li>Not encrypting</li><li>In progress</li><li>Encrypted</li><li>Scrubbing</li></ul> <b>NOTE:</b> This attribute is not applicable, and is blank, when the license for the feature is not installed.                                                                                                                                                                                                                         |
| Percent encrypted      | Percent of user data encrypted.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Backup keystore status | Status of the keystore backup. Valid values are: <ul style="list-style-type: none"><li>No operation required</li><li>Keystore is inaccessible</li><li>Backup keystore operation required</li><li>Backup keystore operation in progress</li><li>Backup keystore operation complete</li></ul> The keystore must be backed up, using the uemcli -download command, and stored off the storage system. <b>NOTE:</b> This attribute is not applicable, and is blank, when the license for the feature is not installed. |
| KMIP status            | Status of KMIP support. Valid values are: <ul style="list-style-type: none"><li>Enabled—KMIP feature is enabled.</li><li>Disabled—KMIP feature is disabled.</li><li>Unsupported—KMIP feature is not supported.</li><li>Unknown—KMIP feature status cannot be determined.</li></ul> <b>NOTE:</b> Once enabled, allows the storage system to interact with external key management servers that are KMIP compliant for key management associated with Data at Rest Encryption.                                       |

# View Data at Rest Encryption settings (physical deployments only)

View Data at Rest Encryption settings.

## Format

```
/prot/encrypt show
```

## Example

The following command lists the Data at Rest Encryption settings on the system:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /prot/encrypt show -detail

Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

1: Encryption mode = Controller Based Encryption
 Encryption status = Encrypted
 Percent encrypted = 100.00%
 Backup keystore status = Backup keystore operation complete
 KMIP status = Enabled
```

# Change encryption setting for KMIP support (physical deployments only)

When encryption and KMIP support are enabled, the storage system interacts with external key management servers that are KMIP compliant for key management associated with the Data at Rest Encryption feature. When encryption is enabled and KMIP support is disabled, the storage system interacts with an internal key management server for key management.

## Format

```
/prot/encrypt set -kmipEnabled {yes | no}
```

## Action qualifiers

| Qualifier    | Description                                                                                                                           |
|--------------|---------------------------------------------------------------------------------------------------------------------------------------|
| -kmipEnabled | Specifies whether to enable or disable KMIP support. Valid values are: <ul style="list-style-type: none"><li>yes</li><li>no</li></ul> |

## Example

The following command changes the encryption setting for KMIP support to enabled:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /prot/encrypt set -kmipEnabled yes

Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

Operation completed successfully.
```

# Manage KMIP support (physical deployments only)

KMIP server configuration of the storage system.

Table 129. KMIP attributes

| Attribute | Description                                                                                                                                                                    |
|-----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ID        | KMIP server identifier.                                                                                                                                                        |
| Username  | Username for accessing the KMIP server.                                                                                                                                        |
| Password  | Password for accessing the KMIP server.                                                                                                                                        |
| Port      | Port number used to establish a connection to a KMIP server.                                                                                                                   |
| Timeout   | Period to establish a connection to a KMIP server. If the system does not receive a reply from the KMIP server before the specified period expires, it stops sending requests. |
| Address   | A list of KMIP server addresses separated with comma. The system uses the addresses in the order from left to right.                                                           |
| State     | A list of KMIP server states (Up, Down, Unknown) separated with comma.                                                                                                         |

## View KMIP settings (physical deployments only)

View settings for KMIP support.

### Format

```
/prot/encrypt/kmip show
```

### Example

The following command lists the Data at Rest Encryption settings on the system:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /prot/encrypt/kmip show
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

1: ID = kmip_0
 Username = admin
 Address = 10.245.95.125
 Port = 5696
 Timeout = 300
 State = Up
```

## Change KMIP support settings (physical deployments only)

Change the key management server parameters related to KMIP support.

### Format

```
/prot/encrypt/kmip set -username <value> {-passwd <value> | -passwdSecure} [-port <value>]
[-timeout <value>] -addr <value>
```

## Action qualifiers

| Qualifier     | Description                                                                                                                                                                                    |
|---------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| -username     | Specify the username to use to access the KMIP server.                                                                                                                                         |
| -passwd       | Specify the password to use to access the KMIP server.                                                                                                                                         |
| -passwdSecure | Specify the password in secure mode - the user will be prompted to input the password and the password confirmation.                                                                           |
| -port         | Specify the port number used by the KMIP server for KMIP communications. Default value is 5696.                                                                                                |
| -timeout      | Specify the timeout for the KMIP server in seconds. If the system does not receive a reply from the KMIP server after the specified timeout, it stops sending requests. Default is 30 seconds. |
| -addr         | Specify a list of KMIP server addresses to designate as default addresses. Separate the addresses with a comma. The system uses the addresses in the order in which they are typed.            |

## Example

The following command changes the KMIP transport settings:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /prot/encrypt/kmip set -username skoobee -passwd doobee -port 5696 -timeout 20 -addr 10.245.95.125
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

Operation completed successfully.
```

## Verify KMIP settings (physical deployments only)

Verify the current connection to the KMIP server.

## Format

```
/prot/encrypt/kmip verify
```

## Example

The following command verifies the connection to the KMIP server:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /prot/encrypt/kmip verify
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

Operation completed successfully.
```

# Data Mobility

This chapter contains the following topics:

## Topics:


- [Manage VNX import sessions](#)
- [Manage VNX import sessions for block](#)
- [Manage VNX import sessions for file](#)
- [View import session elements](#)
- [Manage generic block resource import sessions](#)
- [Manage LUN Move sessions](#)

## Manage VNX import sessions

A VNX import (migration) session is used to import data from a VNX1 or VNX2 storage system (source) to a remote Unity storage system (target). Two types of VNX imports are available:

- Virtual Data Mover (VDM) and its related file systems import
- Block LUN or Consistency Group (CG) of LUNs import

Each import session is identified by an ID. The Unisphere online help provides more details about storage import.

 **NOTE:** At any given point in time, only one command is supported on an import session. Before running a new command, ensure that you wait for the existing action on the import session to complete.

The following table lists the attributes for import sessions:

**Table 130. Import session attributes**

| Attribute    | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|--------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ID           | ID of the import session.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Name         | Name of the import session.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Session type | Type of import session. Valid values are: <ul style="list-style-type: none"> <li>• nas</li> <li>• block</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Health state | Health state of the import session. Valid values are: <ul style="list-style-type: none"> <li>• Unknown (0) — The remote system health cannot be determined.</li> <li>• OK (5) — Session is operating normally.</li> <li>• OK BUT (7) — Session is in one of the following states: <ul style="list-style-type: none"> <li>◦ Session is initialized but paused.</li> <li>◦ Session is paused to migrate data in initial copy.</li> <li>◦ Session is paused to sync data in incremental copy.</li> </ul> </li> <li>• Degraded/Warning (10) — The session failed for one of the following reasons: <ul style="list-style-type: none"> <li>◦ Session failed to read some source files.</li> <li>◦ Session failed to copy file from source to destination.</li> </ul> </li> <li>• Minor failure (15) — The session failed for one of the reasons listed in <a href="#">Reasons for import session Minor failures</a>.</li> <li>• Non-recoverable failure (30) — An error has caused one or more of the following: <ul style="list-style-type: none"> <li>◦ Session failed.</li> <li>◦ Session failed due to an unrecoverable failure in initial copy.</li> <li>◦ Session failed due to an unrecoverable failure in incremental copy.</li> </ul> </li> </ul> |



**Table 130. Import session attributes (continued)**

| Attribute       | Description                                                                                                                                                                                                                                                                                                                                                                                     |
|-----------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Health details  | Additional health information. See Appendix A, Reference, for details.                                                                                                                                                                                                                                                                                                                          |
| State           | State of the import session. Valid values are: <ul style="list-style-type: none"> <li>• Initialized</li> <li>• Initial copy</li> <li>• Ready to cutover</li> <li>• Paused</li> <li>• Cutting over</li> <li>• Incremental copy</li> <li>• Ready to commit</li> <li>• Committing</li> <li>• Completed</li> <li>• Cancelling</li> <li>• Cancelled</li> <li>• Pending</li> <li>• Syncing</li> </ul> |
| Progress        | Import session progress. Only supported for NAS import.                                                                                                                                                                                                                                                                                                                                         |
| Source system   | Remote system identifier for source system.                                                                                                                                                                                                                                                                                                                                                     |
| Source resource | Source resource identifier.                                                                                                                                                                                                                                                                                                                                                                     |
| Target resource | Target resource identifier. Initialized status: empty. Other statuses: Target resource identifier.                                                                                                                                                                                                                                                                                              |

**Table 131. Reasons for import session Minor failures**

| Reasons                                                                               |
|---------------------------------------------------------------------------------------|
| Session failed to provision target resource.                                          |
| Session failed to migrate data in initial copy.                                       |
| Session failed and paused to migrate data in initial copy.                            |
| Session failed to migrate data in initial copy due to connection failure.             |
| Session failed and paused to migrate data in initial copy due to connection failure.  |
| Session failed to migrate data in initial copy due to source IO failure.              |
| Session failed and paused to migrate data in initial copy due to source IO failure.   |
| Session failed to migrate data in initial copy due to target IO failure.              |
| Session failed and paused to migrate data in initial copy due to target IO failure.   |
| Session failed to sync data in incremental copy.                                      |
| Session failed and paused to sync data in incremental copy.                           |
| Session failed to sync data in incremental copy due to connection failure.            |
| Session failed and paused to sync data in incremental copy due to connection failure. |
| Session failed to sync data in incremental copy due to source IO failure.             |
| Session failed and paused to sync data in incremental copy due to source IO failure.  |
| Session failed to sync data in incremental copy due to target IO failure.             |
| Session failed and paused to sync data in incremental copy due to target IO failure.  |
| Session failed to commit.                                                             |
| Session failed to cancel.                                                             |

**Table 131. Reasons for import session Minor failures (continued)**

| Reasons                                                             |
|---------------------------------------------------------------------|
| Session syncing failed.                                             |
| Session syncing failed due to copy file from source to destination. |
| Session failed to cutover.                                          |
| Session has configuration failure.                                  |
| Session failed due to data failure.                                 |
| Session failed due to connection failure.                           |
| Session failed to start.                                            |

## View import sessions

View details about existing import sessions for both file and block. You can filter on the session ID.

### Format

```
/import/session [-id <value> | -active | -completed | -cancelled] [-type {block | nas}]
show
```

### Object qualifier

| Qualifier  | Description                                                                                                                          |
|------------|--------------------------------------------------------------------------------------------------------------------------------------|
| -id        | Type the ID of the import session.                                                                                                   |
| -active    | Show only active sessions (sessions that are not completed or cancelled).                                                            |
| -completed | Show only completed sessions.                                                                                                        |
| -cancelled | Show only cancelled sessions.                                                                                                        |
| -type      | Specifies what type of sessions to show. Valid values are : <ul style="list-style-type: none"> <li>• block</li> <li>• nas</li> </ul> |

### Example

The following command displays all existing import sessions on the system:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /import/session show -detail
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

1: ID = import_1
 Name =
import_sess_vdm1_BB0050562C7D2A_FCNCH0972C330D
 Session type = nas
 Health state = OK (5)
 Health details = "The component is
operating normally. No action is required."
 State = Initialized
 Progress = empty
 Source system = RS_65535
 Source resource = vdm1
 Target resource = nas_1
```

```


2: ID = import_2
 Name = VNX LUN Group 1 import
 Session type = block
 Health state = OK (5)
 Health details = "The component is
operating normally. No action is required."
 State = Initial copy
 Progress =
 Source system = RS_65535
 Source resource = LUNGroup1
 Target resource = res_1

```

## Manage VNX import sessions for block


A block VNX import is the process in which block LUNs or LUN Groups are imported from a VNX1/VNX2 storage system (source) to a remote Unity storage system (target). Block VNX import makes use of the SANCopy feature which must be enabled and configured on the source system.

Each block import session is identified by an ID. The Unisphere online help provides more details about import of block storage.

 **NOTE:** At any given point in time, only one command is supported on a block import session. Before running a new command, ensure that you wait for the existing action on the block import session to complete.

The following table lists the attributes related to block import sessions:

**Table 132. Block import session attributes**

| Attribute      | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|----------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ID             | ID of the block import session.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Name           | Name of the block import session.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Health state   | <p>Health state of the block import session. Valid values are:</p> <ul style="list-style-type: none"> <li>Unknown (0) — The remote system health cannot be determined.</li> <li>OK (5) — Session is operating normally.</li> <li>OK BUT (7) — Session is in one of the following states: <ul style="list-style-type: none"> <li>Session is initialized but paused.</li> <li>Session is paused to migrate data in initial copy.</li> <li>Session is paused to sync data in incremental copy.</li> </ul> </li> <li>Degraded/Warning (10) — The session failed for one of the following reasons: <ul style="list-style-type: none"> <li>Session failed to read some source files.</li> <li>Session failed to copy file from source to destination.</li> </ul> </li> <li>Minor failure (15) — The session failed for one of the reasons listed in <a href="#">Reasons for import sessions Minor failures</a>.</li> <li>Non-recoverable error (30) — An error has caused one or more of the following: <ul style="list-style-type: none"> <li>Session failed.</li> <li>Session failed due to an unrecoverable failure in initial copy.</li> <li>Session failed due to an unrecoverable failure in incremental copy.</li> </ul> </li> </ul> <p> <b>NOTE:</b> If the migration session is in an error state, the session will not be recoverable. You will need to delete the session and create a new migration session.</p> |
| Health details | Additional health information. See Appendix A, Reference, for details.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| State          | <p>State of the block import session. Valid values are:</p> <ul style="list-style-type: none"> <li>Pending</li> <li>Syncing</li> <li>Paused</li> <li>Ready to cutover</li> <li>Cancelling</li> <li>Cancelled</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |

**Table 132. Block import session attributes (continued)**

| Attribute                    | Description                                                                                                                                                                                                                                                                                                                                                                          |
|------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Progress                     | Block import session progress.                                                                                                                                                                                                                                                                                                                                                       |
| Source system                | Remote system identifier for source system.                                                                                                                                                                                                                                                                                                                                          |
| Source resource              | Source resource identifier.                                                                                                                                                                                                                                                                                                                                                          |
| Target resource              | Target resource identifier.                                                                                                                                                                                                                                                                                                                                                          |
| Estimated remaining bytes    | Specifies the current estimated remaining bytes to be transferred for the current import stage. Only supported for block import.                                                                                                                                                                                                                                                     |
| Percent remaining for import | Specifies the percentage of remaining bytes to be imported against the total size of the import resource.                                                                                                                                                                                                                                                                            |
| Cutover threshold percentage | When Percent remaining for import is below this threshold, the state of the import session changes to Ready to cutover.                                                                                                                                                                                                                                                              |
| Throttle                     | Specifies whether to throttle the import transfer. When throttle is applied, the import session data transfer rate will be throttled back to minimize impact on host I/O operations. When throttle is off, the import session functions at full speed which could impact host I/O latencies. Valid values are: <ul style="list-style-type: none"> <li>• yes</li> <li>• no</li> </ul> |

## Create a block import session

### Prerequisites


Before creating a block import session, complete the following configuration tasks:



- Create interfaces on both source and target for data transfer.
- Create an import connection to a Unity-based target system.
- Create a block import target (LUN or LUN Group) on the target system.

### Format

```
/import/session/block create [-async] [-name <value>] [-throttle {yes | no}] -srcSys
<value> -srcRes <value> -lunPoolPairs <value> [-cutoverThreshold <value>] [-hosts <value>]
[-importAsVMwareDatastore {yes | no}]
```

### Action qualifiers

| Qualifier | Description                                                                                                                                                                                                                                                                                                                  |
|-----------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| -async    | Run action in asynchronous mode.                                                                                                                                                                                                                                                                                             |
| -name     | Specifies the name of the import session.<br> <b>NOTE:</b> If name is not specified, it will be generated in the pattern <code>import_sess_&lt;srcRes&gt;_&lt;srcSysSerialNumber&gt;_&lt;targetSysSerialNumber&gt;[_&lt;index&gt;]</code> |
| -throttle | Specifies whether to throttle the import transfer. Throttle impacts the import speed and host latency for the related LUNs and file systems that are in use on the source and target storage systems. Valid values are: <ul style="list-style-type: none"> <li>• yes</li> <li>• no</li> </ul>                                |

| Qualifier                | Description                                                                                                                                                                                                                                                                                                                                                                                |
|--------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                          |  <b>NOTE:</b> Default is to throttle the import transfer, which means that it is throttled at less than the full speed.                                                                                                                                                                                   |
| -srcSys                  | Specifies the source system.                                                                                                                                                                                                                                                                                                                                                               |
| -srcRes                  | Specifies the source resource.                                                                                                                                                                                                                                                                                                                                                             |
| -lunPoolPairs            | Specifies the LUN pool pairs. A comma separated list of mappings between the source LUN and the target storage configuration.<br> <b>NOTE:</b> Use the format <b>srcLUN1:tgtPool1</b> ,...,.... Target LUNs will have the same properties as those of the source LUN, such as name, isThin, SP, and size. |
| -cutoverThreshold        | The percentage threshold below which the import session becomes ready to be cutover.                                                                                                                                                                                                                                                                                                       |
| -hosts                   | Specifies the hosts. A comma separated list of friendly IDs of hosts to give access to target elements.                                                                                                                                                                                                                                                                                    |
| -importAsVMwareDatastore | Specifies whether the source LUN is to be imported as a VMware datastore (VMFS). This option is only valid for a LUN session and is not valid for a CG session. Valid values are: <ul style="list-style-type: none"> <li>• yes</li> <li>• no</li> </ul>                                                                                                                                    |

## Example

The following command creates an import session with these settings:

- Import session name is lun\_17\_import.
- Source storage system is RS\_1.
- Source storage resource is 17.
- LUN pool pair is 17:pool\_1.

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! import/session/block create -name
lun_17_import -srcSys RS_65596 -srcRes 17 -lunPoolPairs 17:pool_1 -importAsVMwareDatastore
yes
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection
```

```
ID = import_1
Operation completed successfully.
```

## Change import session settings for block

Change the settings for a block import session.



### Format

```
/import/session/block -id <value> set [-async] [-name <value>] [-paused {yes | no} [-
throttle {yes | no}] [-cutoverThreshold <value>]
```

### Object qualifier

| Qualifier | Description                        |
|-----------|------------------------------------|
| -id       | Type the ID of the import session. |

## Action qualifiers

| Qualifier         | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|-------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| -async            | Run action in asynchronous mode.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| -name             | Specifies the new name of the import session.                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| -throttle         | <p>Specifies whether to throttle the import transfer. Throttle impacts the import speed and host latency for the related LUNs and file systems that are in use on the source and target storage systems. Valid values are:</p> <ul style="list-style-type: none"><li>• yes</li><li>• no</li></ul> <p> <b>NOTE:</b> Default is to throttle the import transfer, which means that it is throttled at less than the full speed.</p> |
| -paused           | <p>Specifies whether to pause the import session. Valid values are:</p> <ul style="list-style-type: none"><li>• yes</li><li>• no</li></ul> <p> <b>NOTE:</b> no starts or resumes the import session.</p>                                                                                                                                                                                                                         |
| -cutoverThreshold | Specifies the threshold percentage below which the import session is cutover-ready.                                                                                                                                                                                                                                                                                                                                                                                                                               |

## Example

The following command changes the block import session settings for name to newName, the commitThrottle level to 5, and to not apply the throttle:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /import/session/block -id import_1 set -name newName -throttle no -cutoverThreshold 5
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

Operation completed successfully.
```

## Cut over import session for block

Cut over and complete an existing block import session. Cutting over a block import session can be a long and disruptive process. To reduce the period of disruption, set the cutover threshold as small as possible. By decreasing the cutover threshold to a small value, a smaller number of changes will need to be transferred after the application is quiescent. The cutover threshold is a percentage of the LUN size and hence for larger LUNs it is recommended that the cutover threshold be set to a value smaller than the default value of 5 percent. Lastly, cut over an import session only when the session is in the Cutover Ready state. This action ensures that the cutover is performed when the least number of changes has to be transferred.

After cutover completes successfully, host IOs are switched to the target side and the import process completes automatically.

## Format

```
/import/session/block -id <value> cutover [-async]
```

## Object qualifier

| Qualifier | Description                        |
|-----------|------------------------------------|
| -id       | Type the ID of the import session. |

## Action qualifier

| Qualifier | Description                          |
|-----------|--------------------------------------|
| -async    | Run the action in asynchronous mode. |

## Example

The following command cuts the import session, import\_1, over to the target system:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /import/session/block -id import_1
cutover
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

Operation completed successfully.
```

## Cancel a block import session

Cancel an existing block import session.

## Format

```
/import/session/block -id <value> cancel [-async]
```

## Object qualifier

| Qualifier | Description                        |
|-----------|------------------------------------|
| -id       | Type the ID of the import session. |

## Action qualifier

| Qualifier | Description                          |
|-----------|--------------------------------------|
| -async    | Run the action in asynchronous mode. |

## Example

The following command commits the block import session, import\_1.

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /import/session/block -id import_1 cancel
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

Operation completed successfully.
```

## View import sessions for block

View details about import sessions for block. You can filter on the session ID.

## Format

/import/session/block [{-id <value> | -active | -completed | -cancelled}] show

## Object qualifier

| Qualifier  | Description                                                               |
|------------|---------------------------------------------------------------------------|
| -id        | Type the ID of the import session.                                        |
| -active    | Show only active sessions (sessions that are not completed or cancelled). |
| -completed | Show only completed sessions.                                             |
| -cancelled | Show only cancelled sessions.                                             |

## Example

The following command displays block import sessions on the system:

**uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /import/session/block show -detail**

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

1: ID = import_2
 Name = VNX LUN Group 1 import
 Session type = block
 Health state = OK (5)
 Health details = "This import session
is operating normally. No action is required."
 State = Syncing
 Progress = 0%
 Source system = RS_65535
 Source resource = LUNGroup1
 Target resource = res_1
 Estimated remaining bytes = 47185920 (45 M)
 Percent remaining for import = 6
 Cutover threshold percent = 5
 Throttle = no
```

# Manage VNX import sessions for file

A Virtual Data Mover (VDM) file import is the process in which a VDM on a VNX1 or VNX2 storage system (source) is imported to a remote Unity storage system (target). The file systems (common log or split log) associated with the VDM are imported to ufs64 file systems on the target storage system.

Each file import session is identified by an ID. The Unisphere online help provides more details about import of VDM file storage.

**i** **NOTE:** At any given point in time, only one command is supported on a file import session. Before running a new command, ensure that you wait for the existing action on the file import session to complete.

The following table lists the attributes for file import sessions:

**Table 133. File import session attributes**

| Attribute    | Description                                                                                                                                                        |
|--------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ID           | ID of the file import session.                                                                                                                                     |
| Name         | Name of the file import session.                                                                                                                                   |
| Health state | Health state of the import session. Valid values are: <ul style="list-style-type: none"><li>Unknown (0) — The remote system health cannot be determined.</li></ul> |



**Table 133. File import session attributes (continued)**


| Attribute                                                        | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                  | <ul style="list-style-type: none"> <li>• OK (5) —Session is operating normally.</li> <li>• OK BUT (7) —Session is in one of the following states: <ul style="list-style-type: none"> <li>◦ Session is initialized but paused.</li> <li>◦ Session is paused to migrate data in initial copy.</li> <li>◦ Session is paused to sync data in incremental copy.</li> </ul> </li> <li>• Degraded/Warning (10) —The session failed for one of the following reasons: <ul style="list-style-type: none"> <li>◦ Session failed to read some source files.</li> <li>◦ Session failed to copy file from source to destination.</li> </ul> </li> <li>• Minor failure (15) —The session failed for one of the reasons listed in <a href="#">Reasons for import session Minor failures</a> on page 481.</li> <li>• Non-recoverable error (30) —An error has caused one or more of the following: <ul style="list-style-type: none"> <li>◦ Session failed.</li> <li>◦ Session failed due to an unrecoverable failure in initial copy.</li> <li>◦ Session failed due to an unrecoverable failure in incremental copy.</li> </ul> </li> </ul> <p><b>NOTE:</b> If the migration session is in an error state, the session will not be recoverable. You will need to delete the session and create a new migration session.</p> |
| Health details                                                   | Additional health information. See Appendix A, Reference, for details.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| State                                                            | <p>State of the NAS server import session. Valid values are:</p> <ul style="list-style-type: none"> <li>• Initialized</li> <li>• Initial Copy</li> <li>• Ready to Cutover</li> <li>• Cutting Over</li> <li>• Incremental Copy</li> <li>• Ready to commit</li> <li>• Committing</li> <li>• Completed</li> <li>• Cancelling</li> <li>• Cancelled</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Progress                                                         | Import session progress.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Source system                                                    | Remote system identifier for source system.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Source resource                                                  | Source resource identifier.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Source import interface                                          | Source import interface identifier for data transfer.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Source file systems imported as VMWare datastore                 | Source file systems that are imported as VMWare datastore. The value is a list of source file system IDs, in the format of a range (for continuous file system IDs) or a comma separated value (for file systems that are scattered) of source file system IDs. For example, 13,20~25,30.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Source file systems imported with Data Reduction enabled         | Source file systems that are imported with data reduction enabled. The value is a list of source file system IDs, in the format of a range (for continuous file system IDs) or a comma separated value (for file systems that are scattered) of source file system IDs. For example, 13,20~25,30.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Source file systems imported with advanced deduplication enabled | Source file systems that are imported with advanced deduplication enabled.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Target resource                                                  | Target resource identifier.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Target resource pool                                             | Target resource containing pool identifier.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Target file system to pool mapping                               | Target resources are only provisioned after you start the import session (by resuming it). Before the target file systems are provisioned (that is, after creation but before                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |

**Table 133. File import session attributes (continued)**

| Attribute                                   | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|---------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                             | being started), the mapping is from a range (for continuous file system IDs) or a comma separated value (for file system IDs that scatter) of source file system IDs to a target pool. For example, 24~26:pool_1; 28,33~36,40:pool_2;50,55:pool_3;78:pool_4. After all the target file systems are provisioned (that is, after the session started), the mapping is from a range (for continuous file system IDs) or a comma separated value (for file system IDs that are scattered) of target file system IDs to a target pool. For example, res_1~res_3:pool_1; res_4~res_9: pool_2;res_10~res_11:pool_3;res_12:pool_4. |
| Target import interface                     | Target import interface identifier for data transfer.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Target default production port              | Target production port identifier. The default port on which production interfaces are created.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Target production interface to port mapping | Target resources are only provisioned after you start the import session (by resuming it). Before the target production interfaces are provisioned, the mapping is from a list of source production interfaces to a target port. For example, if_6,if_7: spa_iom_0_eth0; if_9:spa_iom_0_eth1. After the target production interfaces are provisioned, the mapping is from a list of target production interfaces to a target port. For example, if_4,if_5:spa_iom_0_eth0; if_7:port spa_iom_0_eth1.                                                                                                                        |
| Target production interface to VLAN mapping | Target resources are only provisioned after you start the import session (by resuming it). Before the target production interfaces are provisioned, the mapping is from a list of source production interfaces to a target VLAN. For example, if_6: 6; if_9:9. After the target production interfaces are provisioned, the mapping is from a list of target production interfaces to a target VLAN. For example, if_4:4; if_7:7.                                                                                                                                                                                           |
| CIFS domain username                        | User name for authentication to Windows domain.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| CIFS domain password                        | Password for authentication to Windows domain.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| CIFS local administrator username           | User name for authentication to SMB server on the source VDM (before the import session is started). This user account is imported to the destination NAS server.                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| CIFS local administrator password           | Password for authentication to SMB server on the source VDM (before the import session is started). This user account is imported to the destination NAS server.                                                                                                                                                                                                                                                                                                                                                                                                                                                           |

## Create a NAS import session

Create a NAS import session.

 **NOTE:** This command only creates the import session. To start the import session through the UEMCLI, you must run the `/import/session/nas set` command and specify **no** for the action qualifier `-paused`.

## Prerequisites

Before creating a NAS import session, complete the following configuration tasks:

- Create interfaces on both the source and target systems for data transfer.
- Create an import connection from the source VNX to the current Unity-based target system.
- Create a target pool.
- If the source VNX system is configured with the code page 8859-1 or 8859-15 for the NFSv3 clients, ensure the code page for the Unity system matches the code page being used on the VNX system. With Unity OE 4.3 and later, the code page of the Unity system can be changed through the `svc_nas {<NAS_server_name> | all} -param -facility vdm -modify codepage -value <value> service` command.

## Format


```
/import/session/nas create [-async] [-name <value>] -srcSys <value> -srcRes <value>
-targetResPool <value>< [-targetImportIf <value>] [-productionIfPortPairs <value>] [-
productionIfVlanPairs <value>] -fsPoolPairs <value>] -defaultProductionPort <value>
```

```
[-srcDhsmUsername <value>] [-srcDhsmPasswd <value>] [-srcDhsmPasswdSecure <value>]
[-unixDirectoryService {directMatch | local | nis | ldap | localThenNis |
localThenLdap | none}] [-srcLocalCifsAdminUsername <value> {-srcLocalCifsAdminPasswd
<value>|-srcLocalCifsAdminPasswdSecure}] [-srcFsImportedAsVMWareDatastore <value>] [-
srcFsImportedWithDataReductionEnabled <value>] [-srcFsImportedWithAdvancedDedupEnabled
<value>] [-skipServerParamCheck]
```

## Action qualifiers

| Qualifier              | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| -async                 | (Optional) Run operation in asynchronous mode.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| -name                  | <p>(Optional) Specifies the new name of the import session.</p> <p><b>i</b> <b>NOTE:</b> If name is not specified, it will be generated in the pattern</p> <pre>import_sess_&lt;srcRes&gt;_&lt;srcSysSerialNumber&gt;_&lt;targetSysSerialNum ber&gt;[_&lt;index&gt;]</pre>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| -srcSys                | Specifies the source (remote) system.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| -srcRes                | Specifies the source resource.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| -targetResPool         | Specifies the default storage pool to store target NAS server configuration information and file systems.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| -targetImportIf        | (Optional) Specifies the target replication interface for the import session.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| -productionIfPortPairs | <p>(Optional) Specifies the source VDM production interfaces and target port pairs. Values are a comma separated list of mappings between source VDM production interfaces and target ports.</p> <p><b>i</b> <b>NOTE:</b> Use the following format:</p> <pre>source_interface_1:dest_port_1,source_interface_2:dest_p ort_2</pre>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| -productionIfVlanPairs | <p>(Optional) Specifies the source VDM production interface and the target VLAN pairs. Values are a comma separated list of mappings between source VDM production interfaces and target VLAN pairs.</p> <p><b>i</b> <b>NOTE:</b> Use the following format:</p> <pre>source_interface_1:1,source_interface_2:2</pre>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| -fsPoolPairs           | <p>(Optional) Specifies the source file system IDs and target pool pairs. Values are a comma separate list of mappings between file system IDs and target pool pairs.</p> <p><b>i</b> <b>NOTE:</b> Use the format <b>sourceFsId1:destination_pool_friendlyId</b> (sourceFsId must be an existing supported source file system ID, otherwise validation fails), or <b>sourceFsId2~sourceFsId3:destination_pool_friendlyId</b> (sourceFsId2 and sourceFsId3 must be existing supported source file system IDs, the other file system IDs between sourceFsId2 and sourceFsId3 do not necessarily need to exist. The create process only takes existing source file system IDs and skips non-existent file system IDs in the range.). For example, for the input <b>12:pool_1,15~20:pool_2</b>, source file system IDs with 12, 15, and 20 must exist but source file systems with IDs starting from 16 to 19 do not need to exist.</p> |
| -defaultProductionPort | Specifies the target port where NAS server production interfaces will be created by default.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| -srcDhsmUsername       | <p>Specifies the user name for authentication to DHSM service on the source Data Mover.</p> <p><b>i</b> <b>NOTE:</b> When the source VDM has FLR-E/C file systems, file import needs to connect to the DHSM service on the source Data Mover. If the DHSM service</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |

| Qualifier                              | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|----------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                        | is configured with basic or digest authentication, the user name needs to be specified.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| -srcDhsmPasswd                         | Specifies the password for authentication to the DHSM service on the source Data Mover.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| -srcDhsmPasswdSecure                   | Specifies the password for authentication to the DHSM service on the source Data Mover in secure mode.<br><b>NOTE:</b> The user will be prompted to input the password and the password confirmation.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| -unixDirectoryService                  | (Optional) Specifies which Unix directory service to import. Directory service is used for querying identity information for Unix (such as UIDs, GIDs, net groups). Valid values are: <ul style="list-style-type: none"> <li>directMatch - Import source unixDirectoryService to target without any change.</li> <li>local - Use Local files (passwd, group, hosts, netgroup) for querying identity information for Unix.</li> <li>nis - Use NIS for querying identity information for Unix.</li> <li>ldap - Use LDAP for querying identity information for Unix.</li> <li>localThinNis - Use Local files and then NIS for querying identity information for Unix.</li> <li>localThinLdap - Use Local files and then LDAP for querying identity information for Unix.</li> <li>none - Do not use any of Unix directory services.</li> </ul>                                                                                |
| -srcLocalCifsAdminUsername             | (Optional) Specifies the user name for authentication to the CIFS server on the source VDM.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| -srcLocalCifsAdminPasswd               | (Optional) Specifies the password for authentication to the CIFS server on the source VDM.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| -srcLocalCifsAdminPasswdSecure         | (Optional) Specifies the password in secure mode.<br><b>NOTE:</b> The user is prompted to input the password and the password confirmation.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| -srcFsImportedAsVMWareDatastore        | (Optional) Specifies what source file systems are imported as VMWare datastore file systems. Values are a comma separated list of source file system IDs with comma separated value of single file system ID or a range of file system IDs; for example, <b>sourceFsId1, sourceFsId2~sourceFsId3</b> . sourceFsId1, sourceFsId2, and sourceFsId3 must be existing supported source file system IDs. The source file systems with IDs between sourceFsId2 and sourceFsId3 do not necessarily need to exist. The create process only takes existing source file system IDs and skips non-existent file systems in the range. For example, for input 13,15~20,25, source file systems with ID 13, 15, 20 and 25 must exist; source file systems with IDs starting from 16 to 19 do not need to exist.<br><b>NOTE:</b> If a VNX file system is specified by this option, it should not contain any tree quotas or user quotas. |
| -srcFsImportedWithDataReductionEnabled | (Optional) Specifies which source file systems are imported with data reduction enabled. Values are a comma separated list of source file system IDs with comma separated value of single file system ID or a range of file system IDs; for example, <b>sourceFsId1, sourceFsId2~sourceFsId3</b> . sourceFsId1, sourceFsId2, and sourceFsId3 must be existing supported source file system IDs. The source file systems with IDs between sourceFsId2 and sourceFsId3 do not necessarily need to exist. The create logic only takes existing source file system IDs and skips non-existent file systems in the range. For example, for input 13,15~20,25, source file systems with ID 13,15,20 and 25 must exist; source file systems with IDs starting from 16 to 19 do not need to exist.                                                                                                                                 |

| Qualifier                              | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|----------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| -srcFsImportedWithAdvancedDedupEnabled | (Optional) Specifies which source file systems are imported with advanced deduplication enabled. Values are a comma separated list of source file system IDs with comma separated value of single file system ID or a range of file system IDs; for example, <b>sourceFsId1,sourceFsId2~sourceFsId3</b> . sourceFsId1, sourceFsId2, and sourceFsId3 must be existing supported source file system IDs. The source file systems with IDs between sourceFsId2 and sourceFsId3 do not necessarily need to exist. The create logic only takes existing source file system IDs and skips non-existent file systems in the range. For example, for input 13,15~20,25, source file systems with ID 13,15,20 and 25 must exist; source file systems with IDs starting from 16 to 19 do not need to exist. |
| -skipServerParamCheck                  | (Optional) Specifies whether to skip server parameters check (comparison). When selected, the server parameters check is skipped. In silent mode, the check is not skipped. Import session creation compares server parameters between VNX and Unity. When import session creation fails with a Server parameter error, this option allows the creation to proceed.<br> <b>NOTE:</b> Skipping the server parameters check could lead to disruptive cutover during import.                                                                                                                                                                                                                                        |

## Example

The following command creates an import session with these settings:

 **NOTE:** The source VDM is a NFS-only VDM.


- Import session name is newName.
- Source storage system is RS\_1.
- Source storage resource (VDM) is src\_vdm\_to\_migrate.
- Target resource pool is pool\_1.
- Target import interface is if\_3.
- Source VDM production interface and target port pairs are source\_interface\_1:spa\_iom\_0\_eth1 and source\_interface\_2:spa\_iom\_0\_eth0.
- Source file system and target pool pairs are 100~200:pool\_2 and 255:pool\_3.
- Target port where NAS server production interfaces will be created is spa\_iom\_0\_eth0.
- Migrate the direct match UNIX Directory Service.
- File systems 13, 20 through 25, and 30 are to be imported as VMWare datastore file systems.
- Skip the server parameters check.

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! import/session/nas create -name
MyName1 -srcSys RS_1 -srcRes src_vdm_to_migrate -targetResPool pool_1 -targetImportIf if_3
-productionIfPortPairs source_interface_1:spa_iom_0_eth1,source_interface_2:spa_iom_0_eth0
-fsPoolPairs 100~200:pool_2,255:pool_3 -defaultProductionPort spa_iom_0_eth0 -
unixDirectoryService directMatch -srcFsImportedAsVMWareDatastore 13,20~25,30 -
skipServerParamCheck
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection
```

```
Using '-skipServerParamCheck' option could lead to disruptive cutover during migration.
Do you want to continue?
yes / no: yes
ID = import_1
Operation completed successfully.
```

The following command creates an import session with these settings:

 **NOTE:** The source VDM is a NFS-only VDM.

- Import session name is newName.
- Source storage system is RS\_1.
- Source storage resource (VDM) is src\_vdm\_to\_migrate.

- Target resource pool is pool\_1.
- Target import interface is if\_3.
- Source VDM production interface and target port pairs are source\_interface\_1:spa\_iom\_0\_eth1 and source\_interface\_2:spa\_iom\_0\_eth0.
- Source file system and target pool pairs are 100~200:pool\_2 and 255:pool\_3.
- Target port where NAS server production interfaces will be created is spa\_iom\_0\_eth0.
- Migrate the direct match UNIX Directory Service.
- File systems 13, 20 through 25, and 30 are to be imported as VMware datastore file systems.
- File systems 14, 22, 25 through 30 are imported as thin.
- File systems 31 and 40 through 45 are imported and have data reduction applied.
- Skip the server parameters check.

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! / import/session/nas create -name
MyName -srcSys RS_1 -srcRes src_vdm_to_migrate -targetResPool pool_1 -targetImportIf if_3
-productionIfPortPairs source_interface_1:spa_iom_0_eth1,source_interface_2:spa_iom_0_eth0
-fsPoolPairs 100~200:pool_2,255:pool_3 -defaultProductionPort spa_iom_0_eth0 -
unixDirectoryService directMatch -srcFsImportedAsVMwareDatastore 13,20~25,30 -
srcFsImportedAsThin 14,22,25~30 -srcFsImportedWithDataReductionEnabled 31,40~45 -
skipServerParamCheck
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection
```

```
ID = import_1
Operation completed successfully.
```

The following command creates an import session with these settings:

**NOTE:** The source VDM is a CIFS-only VDM.

- Import session name is newName.
- Source storage system is RS\_1.
- Source storage resource (VDM) is src\_vdm\_to\_migrate.
- Target resource pool is pool\_1.
- Target import interface is if\_3.
- Source VDM production interface and target port pairs are source\_interface\_1:spa\_iom\_0\_eth1 and source\_interface\_2:spa\_iom\_0\_eth0.
- Source file system and target pool pairs are 100~200:pool\_2 and 255:pool\_3.
- Target port where NAS server production interfaces will be created is spa\_iom\_0\_eth0.
- The user name for authentication to the CIFS server on the source VDM is cifsadmin1
- The password for authentication to the CIFS server on the source VDM is cifspassword1
- File systems 13, 20 through 25, and 30 are to be imported as VMware datastore file systems.
- File systems 14, 22, 25 through 30 are imported as thin.
- File systems 31 and 40 through 45 are imported and have data reduction applied.
- Skip the server parameters check.

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! import/session/nas create -name
MyName1 -srcSys RS_1 -srcRes src_vdm_to_migrate -targetResPool pool_1 -targetImportIf if_3
-productionIfPortPairs source_interface_1:spa_iom_0_eth1,source_interface_2:spa_iom_0_eth0
-fsPoolPairs 100~200:pool_2,255:pool_3 -defaultProductionPort spa_iom_0_eth0 -
srcFsImportedAsVMwareDatastore 13,20~25,30 -srcLocalCifsAdminUsername cifsadmin1 -
srcLocalCifsAdminPasswd cifspassword1 -skipServerParamCheck
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection
```

```
Using '-skipServerParamCheck' option could lead to disruptive cutover during migration.
Do you want to continue?
yes / no: yes
ID = import_1
Operation completed successfully.
```

## Change import session settings for file

Change the settings for a NAS import session.



### Format


```
/import/session/nas -id <value> set [-async] [-paused {yes | no}] -name
<value> [-targetResPool <value>] [-fsPoolPairs <value>] [-targetImportIf <value>] [-
productionIfPortPairs <value>] [-productionIfVlanPairs <value>] [-srcLocalCifsAdminUsername
<value> {-srcLocalCifsAdminPasswd <value> | srcLocalCifsAdminPasswdSecure}] [-
srcFsImportedAsVMwareDatastore <value>] [-srcFsImportedWithDataReductionEnabled <value>] [-
srcFsImportedWithAdvancedDedupEnabled <value>]]
```

### Object qualifier

| Qualifier | Description                        |
|-----------|------------------------------------|
| -id       | Type the ID of the import session. |


### Action qualifiers

| Qualifier                      | Description                                                                                                                                                                                                                                                            |
|--------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| -async                         | Run action in asynchronous mode.                                                                                                                                                                                                                                       |
| -name                          | Specifies the new name of the import session.                                                                                                                                                                                                                          |
| -paused                        | Specifies whether to pause the session. Valid values are: <ul style="list-style-type: none"><li>• yes</li><li>• no</li></ul>  <b>NOTE:</b> no starts or resumes the import session. |
| -targetResPool                 | Specifies the new pool for the target resource. Applicable only when the session status is Initialized or the target NAS server provision fails.                                                                                                                       |
| -fsPoolPairs                   | Specifies the source file system IDs and target pool pairs. Applicable only when the session status is Initialized or the target file system provision fails.                                                                                                          |
| -targetImportIf                | Specifies the new target migration interface. Applicable only when the session status is Initialized or the target NAS server provision fails.                                                                                                                         |
| -productionIfPortPairs         | Specifies the source VDM production interface and target port pairs. Applicable only when the session status is Initialized or the target production interface creation fails.                                                                                         |
| -productionIfVlanPairs         | Specifies the source VDM production interface and the target VLAN pairs. Applicable only when the session status is Initialized or the target production interface creation fails.                                                                                     |
| -srcLocalCifsAdminUsername     | Specifies the user name for authentication to the CIFS server on the source VDM.                                                                                                                                                                                       |
| -srcLocalCifsAdminPasswd       | Specifies the password for authentication to the CIFS server on the source VDM.                                                                                                                                                                                        |
| -srcLocalCifsAdminPasswdSecure | Specifies the password in secure mode.<br> <b>NOTE:</b> The user is prompted to input the password and the password confirmation.                                                   |

| Qualifier                                           | Description                                                                                                                                                                                                                                                                                                                                              |
|-----------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <code>-srcFsImportedAsVMWareDatastore</code>        | Specifies what source file systems are imported as VMware datastore file systems. Only applies to file import when the session is initialized.<br> <b>NOTE:</b> If a VNX file system is specified by this option, it should not contain any tree quotas or user quotas. |
| <code>-srcFsImportedWithDataReductionEnabled</code> | Specifies which source file systems are imported with data reduction enabled. Only applies to file import when the session is initialized.                                                                                                                                                                                                               |
| <code>-srcFsImportedWithAdvancedDedupEnabled</code> | Specifies which source file systems are imported with advanced deduplication enabled. Only applies to file import when the session is initialized.                                                                                                                                                                                                       |

## Example

The following command changes the NAS import session settings:

 **NOTE:** This command only makes changes to the import session configuration. To resume (start) the import session through the UEMCLI, you must run the `/import/session/nas set` command and specify **no** for the action qualifier `-paused`.

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /import/session/nas -
id import_1 set -name newName -targetResPool pool_2 -targetImportIf if_3 -
productionIfPortPairs source_interface_1:spa_iom_0_eth1,source_interface_2:spa_iom_0_eth0
-fsPoolPairs 100~200:pool_2,255:pool_3 -srcFsImportedAsVMWareDatastore 17~20 -
srcFsImportedWithDataReductionEnabled 31,40~45
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection
```

```
Operation completed successfully.
```

## Start or resume an import session

Once an import session is created and optionally modified, it remains in the initialized state until it is started (or resumed). The following command starts (or resumes) the example NAS import session:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /import/session/nas -id import_1 set -
paused no
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection
```

```
Operation completed successfully.
```

## Cutover import session for file

Cut over an existing NAS import session. Cutting over a session switches the active host IOs to the target side and initiates the incremental data synchronization from the source to the target.

### Format



```
/import/session/nas -id <value> cutover [-async] [-netbiosName <value>] [-cifsServerName
<value> -domainUsername <value> {-domainPasswd <value> | -domainPasswdSecure}]
```



## Object qualifier

| Qualifier | Description                             |
|-----------|-----------------------------------------|
| -id       | Specifies the ID of the import session. |

## Action qualifier

| Qualifier           | Description                                                                                                                                                                                                                                                                                                                                                           |
|---------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| -async              | Run the action in asynchronous mode.                                                                                                                                                                                                                                                                                                                                  |
| -netbiosName        | Specifies new NetBIOS name for source the CIFS server.                                                                                                                                                                                                                                                                                                                |
| -cifsServerName     | Specifies the new name for the source CIFS server after the cutover. SMB (CIFS) server name must be unique on the network.<br> <b>NOTE:</b> If not specified, the default name for renaming the source CIFS server is the original CIFS server name prefixed with an underscore (_). |
| -domainUsername     | Specifies the domain administrator name. This name is required for renaming the source CIFS server and joining it to the Active Directory. (Used for AD-joined CIFS server migration only)                                                                                                                                                                            |
| -domainPasswd       | Specifies the domain user password.                                                                                                                                                                                                                                                                                                                                   |
| -domainPasswdSecure | Specifies the password in secure mode.<br> <b>NOTE:</b> The user is prompted to input the password and the password confirmation.                                                                                                                                                    |

## Example 1

The following command cuts the NFS import session, import\_1, over to the target system:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /import/session/nas -id import_1 cutover
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

Operation completed successfully.
```

## Example 2

The following command cuts the SMB import session, import\_1, over to the target system:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /import/session/nas -id import_1 cutover
-cifsServerName cifs1 -domainUsername user1 -domainPasswd password1
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

Operation completed successfully.
```

## Commit import session for file

Commit an existing NAS import session. Committing a session completes the import process.

## Format

```
/import/session/nas -id <value> commit [-async]
```

## Object qualifier

| Qualifier | Description                        |
|-----------|------------------------------------|
| -id       | Type the ID of the import session. |

## Action qualifier

| Qualifier | Description                          |
|-----------|--------------------------------------|
| -async    | Run the action in asynchronous mode. |

## Example

The following command commits the import session, import\_1.

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /import/session/nas -id import_1 commit
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

Operation completed successfully.
```

## Cancel a NAS import session

Cancel an existing NAS import session.

## Format


```
/import/session/nas -id <value> cancel [-async] [-domainUsername <value> {-domainPasswd <value> | -domainPasswdSecure}] [-skipSourceRestore]
```

## Object qualifier

| Qualifier | Description                        |
|-----------|------------------------------------|
| -id       | Type the ID of the import session. |

## Action qualifier

| Qualifier           | Description                                                                                                       |
|---------------------|-------------------------------------------------------------------------------------------------------------------|
| -async              | Run the action in asynchronous mode.                                                                              |
| -domainUsername     | Specifies the domain user with administrative rights to update the AD (not necessary for standalone CIFS server). |
| -domainPasswd       | Specifies the domain user password (not necessary for standalone CIFS server).                                    |
| -domainPasswdSecure | Specifies the password in secure mode (not necessary for standalone CIFS server).                                 |

| Qualifier          | Description                                                                                                                                                                                                                                                                                                                                                                                              |
|--------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                    |  <b>NOTE:</b> The user is prompted to input the password and the password confirmation.                                                                                                                                                                                                                                 |
| -skipSourceRestore | Skip source VDM restore. When specified, the source VDM restore operations are skipped. Normally, the cancel action stops the import transport, deletes the corresponding destination resources, and restores the source VDM (turns up the source interfaces attached to the VDM if they are turned down during cutover and deletes internal export options created by the import for import transport). |

## Example

The following command cancels the NAS import session, import\_1.

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /import/session/nas -id import_1 cancel
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

Operation completed successfully.
```

## View import sessions for file

View details about import sessions for file. You can filter on the session ID.

### Format

```
/import/session/nas [{-id <value> | -active | -completed | -cancelled}] show
```

### Object qualifier

| Qualifier  | Description                                                               |
|------------|---------------------------------------------------------------------------|
| -id        | Type the ID of the import session.                                        |
| -active    | Show only active sessions (sessions that are not completed or cancelled). |
| -completed | Show only completed sessions.                                             |
| -cancelled | Show only cancelled sessions.                                             |

## Example

The following command displays file import sessions on the system:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /import/session/nas show -detail
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

1: ID = import_1
 Protocol = NFS
 Name =
import_sess_vdm1_BB0050562C7D2A_FCNCH0972C330D
 Health state = OK (5)
 Health details = "The component
is operating normally. No action is required."
 State = Initialized
 Progress =
```

```

Source system = RS_1
Source resource = vdm1
Source import interface = nas_migration_1
Source file systems imported as VMware datastore = 13,20~25,30
Source file systems imported with Data Reduction enabled = 31,40~45
Source file systems imported with advanced deduplication enabled = 31,40~45
Target resource =
Target resource pool = pool_1
Target file system to pool mapping = 13~14:pool_1
Target import interface = if_3
Target default production port = spa_iom_0_eth0
Target production interface to port mapping =
filesim8129dm2:spa_iom_0_eth0
Target production interface to vlan mapping = filesim8129dm2:1
CIFS local administrator username = admin
Source DHSM user = dhsm_admin

```

## View import session elements

View details about import status for each element in the active import session, for example, each LUN in a consistency group (CG).

The following table lists the attributes for import session elements:

**Table 134. Import session elements attributes**

| Attribute       | Description                                                                                                                                                |
|-----------------|------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Source system   | Identifies the source system.                                                                                                                              |
| Source resource | Identifies the source resource.                                                                                                                            |
| Target resource | Identifies the target resource.                                                                                                                            |
| Health state    | Health state of the import element.                                                                                                                        |
| Health details  | Additional health information.                                                                                                                             |
| Stage           | Import data transfer stage. Valid values are: <ul style="list-style-type: none"> <li>Initial sync</li> <li>Incremental sync</li> <li>Final sync</li> </ul> |
| Iteration       | Iteration number in this stage of the import data transfer. This property only applies to the incremental copy stage for LUN import.                       |
| Progress        | Import progress of current sync iteration.                                                                                                                 |

## Format

```
/import/session/element -importId <value> show
```

## Object qualifier

| Qualifier | Description                        |
|-----------|------------------------------------|
| -importId | Type the ID of the import session. |

## Example

The following command displays import status for each element in the specified import session:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /import/session/element -importId
import_2 show -detail
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

1: Source system = RS_1
 Source resource = lun1
 Target resource = sv_1
 Health state = OK (5)
 Health details = "The component is operating normally. No action is required."
 Stage = Incremental Sync
 Iteration = 4
 Progress = 10%
 Source system = RS_1
 Source resource = lun4
 Target Resource = sv_2
 Health state = OK (5)
 Health details = "The component is operating normally. No action is required."
 Stage = Incremental sync
 Iteration = 4
 Progress = 0%
```

## Manage generic block resource import sessions

This command imports generic block resources (such as LUNS, volumes, or virtual disks) from a third-party block storage system which provides a Fibre Channel (FC) or iSCSI interface to its block devices (LUNs). It uses the SAN Copy Pull feature running on the local storage system.


If the iSCSI protocol is used, iSCSI connections and connection paths must have been created and configured before you can manage generic import sessions. Refer to the "Manage iSCSI connections" and "Manage iSCSI connection paths" sections in this chapter for more information about configuring iSCSI connections and connection paths.

The following table lists the attributes for import sessions:

**Table 135. Import session attributes**

| Attribute    | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|--------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ID           | ID of the import session.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Name         | Name of the import session.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Description  | Description of the import session.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Health state | Health state of the import session. Valid values are: <ul style="list-style-type: none"> <li>Unknown (0) — The remote system health cannot be determined.</li> <li>OK (5) — Session is in one of the following states: <ul style="list-style-type: none"> <li>Session is operating normally.</li> <li>Session is completed.</li> <li>Session is cancelled.</li> </ul> </li> <li>OK_BUT (7) — Session is in one of the following states: <ul style="list-style-type: none"> <li>Session was recovered on SP reboot.</li> <li>Session is queued.</li> <li>Session is paused.</li> </ul> </li> <li>Degraded/Warning (10) — Session is in one of the following states: <ul style="list-style-type: none"> <li>Auto-recovery is in progress.</li> <li>Recovery on SP reboot.</li> <li>Waiting on LUN trespass.</li> </ul> </li> <li>Minor failure (15) — The session failed either because an SP is down or the session was aborted.</li> <li>Major failure — The session failed for one of the following reasons: <ul style="list-style-type: none"> <li>A bad block was encountered on the source block resource.</li> </ul> </li> </ul> |

**Table 135. Import session attributes (continued)**

| Attribute            | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|----------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                      | <ul style="list-style-type: none"> <li>○ A restart on auto recovery failed.</li> <li>○ The session was halted on an SP reboot.</li> <li>○ The destination LUN and the import session are on different SPs.</li> <li>○ The destination LUN has been trespassed.</li> <li>● Critical failure — The session failed for one of the following reasons: <ul style="list-style-type: none"> <li>○ Either the source block resource or destination LUN was not found.</li> <li>○ Either the source block resource or destination LUN is inaccessible.</li> <li>○ The source block resource has an invalid connection type.</li> <li>○ The source block resource failed.</li> <li>○ The destination LUN is inconsistent.</li> </ul> </li> <li>● Non-recoverable failure (30) — A non-recoverable error caused the session to fail.</li> </ul>                                                                           |
| Health details       | Additional health information. See Appendix A, Reference, for details.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| State                | <p>State of the import session. Valid values are:</p> <ul style="list-style-type: none"> <li>● Initialized</li> <li>● Pending</li> <li>● Running</li> <li>● Paused</li> <li>● Failed</li> <li>● Completed</li> <li>● Cancelled</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| SP owner             | <p>Default destination LUN SP owner. Valid values are:</p> <ul style="list-style-type: none"> <li>● SPA</li> <li>● SPB</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| Source system name   | Remote system name provided by the user when the session was created.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Source LUN WWN       | <p>Source block resource World Wide Name (WWN). The WWN can be passed with the following four prefixes:</p> <ul style="list-style-type: none"> <li>● wwn.</li> <li>● nna.</li> <li>● wwn-0x.</li> <li>● 0x.</li> </ul> <p>It is possible to pass the WWN without any prefixes. For example, the following notations of WWN can be used:</p> <ul style="list-style-type: none"> <li>● 50060485c5edaa5d—16 hexadecimal chars</li> <li>● 50:06:04:85:c5:ed:aa:5d—Bytes separated by colons</li> <li>● 50:6:4:85:c5:ed:aa:5d—Leading nibble of the byte dropped if the nibble is zero</li> <li>● 50-06-04-85-c5-ed-aa-5d—Bytes separated by dashes</li> </ul> <p> <b>NOTE:</b> If the system rejects the WWN as non-recognizable, you can convert the WWN manually to the Dell EMC Unity system form, such as 60:00:01:6F..</p> |
| Target resource      | CLI ID of the destination storage resource.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Target resource name | Name of the destination storage resource.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Target resource type | <p>Type of the destination resource. Valid values are:</p> <ul style="list-style-type: none"> <li>● LUN</li> <li>● VMware VMFS</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Size of source       | Size of data to transfer from the source block resource to the destination LUN.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Size copied          | Total bytes transferred from the source block resource to the destination LUN.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Size remaining       | Current remaining size in bytes to be transferred from the source block resource to the destination LUN.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |

**Table 135. Import session attributes (continued)**

| Attribute                  | Description                                                                                                                                                                                                                                                                              |
|----------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Percent completed          | Percentage of bytes transferred from the source block resource to the destination LUN.                                                                                                                                                                                                   |
| Start time                 | Start time of the copying process.                                                                                                                                                                                                                                                       |
| Estimated time to complete | Current estimated time to complete the copying of the source block resource to the destination LUN.                                                                                                                                                                                      |
| Throttle                   | Reduces CPU load and I/O latency on the destination system. The lower the throttle value, the less impact on the host latency and the longer the import will take. Valid values are: <ul style="list-style-type: none"> <li>• Low</li> <li>• Medium</li> <li>• High (default)</li> </ul> |


## Create a generic import session

Create an import session for third-party systems.

### Format

```
/import/session/generic create [-name <value>] [-descr <value>] [-srcSystemName <value>] -srcLUNWWN <value> {-targetRes <value> | -targetResName <value>} [-throttle {Low | Medium | High}] [-async]
```

### Action qualifiers

| Qualifier      | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|----------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| -name          | Identifies the import session by unique name. If this name is not specified, it will be generated, using the pattern: <target LUN CLI ID>-<target LUN name>-<timestamp>. For example, the name might be generated as sv_1-LUN01-20180601T160654.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| -descr         | Specifies the import session description.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| -srcSystemName | Remote third-party system name. If this name is not specified, the option is left empty and the session cannot be tracked by the remote system name.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| -srcLUNWWN     | Specifies the WWN of the source LUN. The WWN can be passed with the following four prefixes: <ul style="list-style-type: none"> <li>• wwn.</li> <li>• nna.</li> <li>• wwn-0x.</li> <li>• 0x.</li> </ul> It is possible to pass the WWN without any prefixes. For example, the following notations of WWN can be used: <ul style="list-style-type: none"> <li>• 50060485c5edaa5d—16 hexadecimal chars</li> <li>• 50:06:04:85:c5:ed:aa:5d—Bytes separated by colons</li> <li>• 50:6:4:85:c5:ed:aa:5d—Leading nibble of the byte dropped if the nibble is zero</li> <li>• 50-06-04-85-c5-ed-aa-5d—Bytes separated by dashes</li> </ul> <p> <b>NOTE:</b> If the system rejects the WWN as non-recognizable, you can convert the WWN manually to the Dell EMC Unity system form, such as 60:00:01:6F..</p> |
| -targetRes     | CLI ID of the destination storage resource.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| -targetResName | Name of the destination storage resource.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| -throttle      | Specifies the import session throttle value. Valid values are: <ul style="list-style-type: none"> <li>• Low</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |

| Qualifier           | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|---------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                     | <ul style="list-style-type: none"> <li>Medium</li> <li>High (default)</li> </ul> <p><b>NOTE:</b> You can change the Throttle setting when a session is running or paused. Only the <code>/import/session/generic show -detail</code> CLI command output will reflect this change when the session is running. However, after the session is completed, that command's output reflects the Throttle value that was set when the session was created, and not the changed value.</p> |
| <code>-async</code> | Run the operation in asynchronous mode.                                                                                                                                                                                                                                                                                                                                                                                                                                            |

## Example

The following command creates an import session.

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /import/session/
generic create -name lun_17_import -srcSystemName MyOldGranSystem -srcLUNWWN
06:00:00:00:05:00:00:00:01:00:00:00:00:00:00:03 -targetRes sv_1 -throttle High
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection
```

```
ID = glimp_1
Operation completed successfully.
```

## View generic import session settings

View details about existing import sessions for third-party systems.

### Format

```
/import/session/generic [{-id <value> | -name <value> | -srcSystemName <value> | -active |
-running | -paused | -failed | -pending | -completed | -cancelled}] show
```

### Object qualifiers

| Qualifier                   | Description                                                                            |
|-----------------------------|----------------------------------------------------------------------------------------|
| <code>-id</code>            | Type the ID of the import session.                                                     |
| <code>-name</code>          | Type the unique name for the import session.                                           |
| <code>-srcSystemName</code> | Third-party system name provided by the user at import session creation.               |
| <code>-active</code>        | Show only active sessions (all sessions that are running, paused, failed, or pending). |
| <code>-running</code>       | Show only running sessions.                                                            |
| <code>-paused</code>        | Show only paused sessions.                                                             |
| <code>-failed</code>        | Show only failed sessions.                                                             |
| <code>-pending</code>       | Show only pending sessions.                                                            |
| <code>-completed</code>     | Show only completed sessions.                                                          |
| <code>-cancelled</code>     | Show only cancelled sessions.                                                          |



## Example

The following command displays all import sessions on the system:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /import/session/generic show -detail
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

1: ID = gen_import_1
 Name = Session_for1527875375
 Description =
 Health state = OK (5)
 Health details = "The generic LUN import session is running normally."
 State = Running
 SP owner = SPB
 Trespassed = no
 Source system name =
 Source LUN WWN = 60:06:01:60:0B:10:3D:00:80:84:11:5B:3A:20:8E:6A
 Target resource = sv_23
 Target resource name = destLun_Compression_Disabled_TLU_1_Standalone
 Target resource type = LUN
 Size of source = 21474836480 (20.0G)
 Size copied = 408944640 (390.0M)
 Size remaining = 21065891840 (19.6G)
 Percent completed = 1%
 Start time = 2018-06-01 17:50:03
 Estimated time to complete = 2018-06-02 01:32:58
 Throttle = Low

2: ID = gen_import_2
 Name = Session_for1527875405
 Description =
 Health state = OK (5)
 Health details = "The generic LUN import session is running normally."
 State = Running
 SP owner = SPA
 Trespassed = no
 Source system name =
 Source LUN WWN = 60:06:01:60:0B:10:3D:00:8A:84:11:5B:55:AD:35:5D
 Target resource = sv_24
 Target resource name = destLun_DLU_1_Ds
 Target resource type = VMware VMFS
 Size of source = 21474836480 (20.0G)
 Size copied = 81264640 (77.5M)
 Size remaining = 21393571840 (19.9G)
 Percent completed = 0%
 Start time = 2018-06-01 17:50:39
 Estimated time to complete = 2018-06-01 19:14:35
 Throttle = Low
```

## Change generic import session settings

Changes the existing import sessions settings for third-party systems.

### Format

```
/import/session/generic {-id <value> | -name <value>} set [-newName <value>] [-descr <value>] [-srcSystemName <value>] [-throttle <value>] [-async]
```

## Object qualifiers

| Qualifier | Description                                  |
|-----------|----------------------------------------------|
| -id       | Type the ID of the import session.           |
| -name     | Type the unique name for the import session. |

## Action qualifiers

| Qualifier      | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|----------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| -newName       | Specifies the new name of the import session.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| -descr         | Specifies the import session description.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| -srcSystemName | Remote third-party system name. If this name is not specified, the option is left empty and the session cannot be tracked by the remote system name.                                                                                                                                                                                                                                                                                                                                                                                                   |
| -throttle      | Specifies the import session throttle value. Valid values are: <ul style="list-style-type: none"><li>• Low</li><li>• Medium</li><li>• High</li></ul> <p><b>NOTE:</b> You can change the Throttle setting when a session is running or paused. Only the <code>/import/session/generic show -detail</code> CLI command output will reflect this change when the session is running. However, after the session is completed, that command's output reflects the Throttle value that was set when the session was created, and not the changed value.</p> |
| -async         | Run the operation in asynchronous mode.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |

## Example

The following command changes the import session settings for name to newName:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /import/session/generic -id gen_import_1 set -name newName
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

Operation completed successfully.
```

## Pause a generic import session

Pauses a running third-party system import session.

## Format

```
/import/session/generic {-id <value> | -name <value>} pause [-async]
```

## Object qualifiers

| Qualifier | Description                                  |
|-----------|----------------------------------------------|
| -id       | Type the ID of the import session.           |
| -name     | Type the unique name for the import session. |

## Action qualifier

| Qualifier | Description                             |
|-----------|-----------------------------------------|
| -async    | Run the operation in asynchronous mode. |

## Example

The following command pauses the "gen\_import\_1" import session:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /import/session/generic -id gen_import_1 pause
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection
```

```
Operation completed successfully.
```

## Resume a generic import session

Resumes running a third-party system import session.

## Format

```
/import/session/generic {-id <value> | -name <value>} resume [-async]
```

## Object qualifiers

| Qualifier | Description                                  |
|-----------|----------------------------------------------|
| -id       | Type the ID of the import session.           |
| -name     | Type the unique name for the import session. |

## Action qualifier

| Qualifier | Description                             |
|-----------|-----------------------------------------|
| -async    | Run the operation in asynchronous mode. |

## Example

The following command resumes the "gen\_import\_1" import session:


```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /import/session/generic -id gen_import_1 resume
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection
```

```
Operation completed successfully.
```

## Cancel a generic import session

Cancels an existing active or failed third-party system import session.

 **NOTE:** Once an import session has been cancelled, it cannot be restarted.

### Format

```
/import/session/generic {-id <value> | -name <value>} cancel [-async]
```

### Object qualifiers

| Qualifier | Description                                  |
|-----------|----------------------------------------------|
| -id       | Type the ID of the import session.           |
| -name     | Type the unique name for the import session. |

### Action qualifier

| Qualifier | Description                             |
|-----------|-----------------------------------------|
| -async    | Run the operation in asynchronous mode. |

### Example

The following command cancels the "gen\_import\_1" import session:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /import/session/generic -id gen_import_1 cancel
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

Operation completed successfully.
```

## Restart a generic import session

Restarts a failed third-party system import session, once the cause of the failure has been fixed. The session restarts and copies data from the last block address saved in a checkpoint. However, if the Throttle value was changed while the session was running, the Throttle value that was set when the initial session was created is used, and not the changed value.

### Format

```
/import/session/generic {-id <value> | -name <value>} restart [-async]
```

### Object qualifiers

| Qualifier | Description                                  |
|-----------|----------------------------------------------|
| -id       | Type the ID of the import session.           |
| -name     | Type the unique name for the import session. |

## Action qualifier

| Qualifier | Description                             |
|-----------|-----------------------------------------|
| -async    | Run the operation in asynchronous mode. |

## Example

The following command restarts the "gen\_import\_1" import session:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /import/session/generic -id gen_import_1 restart
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection
```

```
Operation completed successfully.
```

## Delete a generic import session

Deletes a specified cancelled or completed third-party system import session. The delete operation erases all historical data for the specified import session.

## Format

```
/import/session/generic {-id <value> | -name <value>} delete [-async]
```

## Object qualifiers

| Qualifier | Description                                  |
|-----------|----------------------------------------------|
| -id       | Type the ID of the import session.           |
| -name     | Type the unique name for the import session. |

## Action qualifier

| Qualifier | Description                             |
|-----------|-----------------------------------------|
| -async    | Run the operation in asynchronous mode. |

## Example

The following command deletes the "gen\_import\_1" import session:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /import/session/generic -id gen_import_1 delete
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection
```

```
Operation completed successfully.
```

# Manage LUN Move sessions

Use the LUN Move feature when you need to move existing LUNs in the system, such as between pools for load balancing, to take advantage of newly purchased spindles, or to enable data reduction (for either newly-written data or both newly-written data and existing data) on a thin LUN in an All Flash pool. Note that if you choose to apply data reduction to existing data, the LUN data is moved within the same pool.

If you move a LUN that:

- Has not had data reduction applied, it is moved as uncompressed.
- Has had data reduction applied, and it is being moved to an All Flash pool, it is moved as compressed. If you are not moving it to an All Flash pool, it is moved as uncompressed.
- Not thin, it is moved as not thin.
- Thin, it is moved as thin.

The following table lists the attributes for moving LUNs:

Table 136. LUN move attributes

| Attribute         | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|-------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ID                | ID of the move session.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Source resource   | Storage resource for the source.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Source member LUN | Source member LUN, if the storage resource is a LUN group.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Destination pool  | Pool for the destination.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| State             | Current state that represents the lifecycle of a move session. Value is one of the following: <ul style="list-style-type: none"><li>• <code>Initializing</code>—Move session is in the process of initializing.</li><li>• <code>Queued</code>—Move session is queued to run. The system begins the data transfer when sufficient resources are available.</li><li>• <code>Running</code>—Indicates that the move session is transferring data.</li><li>• <code>Failed</code>—Move session has failed. Consult the move session's health for more details.</li><li>• <code>Cancelling</code>—Indicates that the move session is in the process of being cancelled.</li><li>• <code>Cancelled</code>—Indicates that the move session has been cancelled.</li><li>• <code>Completed</code>—Data transfer for the move session has completed.</li></ul> |
| Progress          | Progress of the move session expressed as a percentage.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Health state      | Health state of the move session. Value is one of the following: <ul style="list-style-type: none"><li>• <code>Unknown</code>—The move session health cannot be determined.</li><li>• <code>OK</code>—The move session is operating normally.</li><li>• <code>Major failure</code>—One of the following:<ul style="list-style-type: none"><li>◦ The pool went offline and the move cannot continue. Please remove the move session, address the issue, and recreate the move session.</li><li>◦ The pool exhausted the space available and the move cannot continue. Please remove the move session, address the issue, and recreate the move session.</li><li>◦ The move session encountered an internal error. Please contact your service provider.</li></ul></li></ul>                                                                          |
| Health details    | Additional health information. See Appendix A, Reference, for health information details.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Priority          | Priority for the move session. Value is one of the following: <ul style="list-style-type: none"><li>• <code>Idle</code>—No copy I/O generated. The move session continues to mirror host I/O.</li><li>• <code>Low</code>—Designated for move sessions that have the least priority over other move sessions.</li><li>• <code>Below normal</code>—Designated for move sessions that are slightly less critical than the average or normal move session.</li><li>• <code>Normal</code>—Designated for move sessions that are appropriate for most use cases. This is the default value.</li><li>• <code>Above normal</code>—Designated for move sessions that are slightly more critical than the average or normal move session.</li></ul>                                                                                                           |

**Table 136. LUN move attributes (continued)**

| Attribute             | Description                                                                                                                                  |
|-----------------------|----------------------------------------------------------------------------------------------------------------------------------------------|
|                       | <ul style="list-style-type: none"> <li>High—Designated for move sessions that take the highest priority over other move sessions.</li> </ul> |
| Average transfer rate | Average transfer rate of the move session in MB/sec.                                                                                         |
| Current transfer rate | Current transfer rate of the move session in MB/sec.                                                                                         |
| Estimated time left   | Estimated time remaining in seconds based on the current transfer rate.                                                                      |

## Create a LUN move session

### Format

```
/move/session create -srcRes <value> [-srcMemberLun <value>] -targetPool <value> [-priority {idle | low | below | normal | above | high}] [-thin {yes | no}] [-dataReductionEnabled {yes [-advancedDedupEnabled {yes | no}] | no}] [-async]
```

### Action qualifiers

| Qualifier             | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|-----------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| -srcRes               | LUN identifier for a standalone source LUN, or a Consistency Group identifier if moving a LUN that is a member of the Consistency Group.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| -srcMemberLun         | Source LUN identifier if the LUN is a member of a Consistency Group.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| -targetPool           | Identifier of the destination storage pool where the moved resources will be created.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| -priority             | Priority of the move session. Valid values are: <ul style="list-style-type: none"> <li>idle—Designated for move sessions that continue to mirror the host I/O.</li> <li>low—Designated for move sessions that have the least priority over other move sessions.</li> <li>below—Designated for move sessions that are slightly less critical than the average or normal move session.</li> <li>normal (default)—Designated for move sessions that are appropriate for most use cases.</li> <li>above—Designated for move sessions that are slightly more critical than the average or normal move session.</li> <li>high—Designated for move sessions that take the highest priority over other move sessions.</li> </ul> |
| -thin                 | Indicates whether to create a thin destination. Valid values are: <ul style="list-style-type: none"> <li>yes (default)</li> <li>no</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| -dataReductionEnabled | Indicates whether to create a destination that will have data reduction applied to it. Valid values are: <ul style="list-style-type: none"> <li>yes</li> <li>no (default)</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| -advancedDedupEnabled | Indicates whether to create a destination that will have advanced deduplication applied to it. This option only applies when data reduction is enabled. Valid values are: <ul style="list-style-type: none"> <li>yes</li> <li>no (default)</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| -async                | Run the operation in asynchronous mode.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |

## Example 1

The following command creates a move session.

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /move/session create -srcRes sv_1 -targetPool pool_1 -priority above -thin yes -dataReductionEnabled no
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

ID = move_1
Operation completed successfully.
```

## Example 2

The following command creates a move session, including the source member LUN ID.

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /move/session create -srcRes res_1 -sourceMemberLun sv_2 -targetPool pool_2 -priority above -thin yes -dataReductionEnabled yes -advancedDedupEnabled yes
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

ID = move_2
Operation completed successfully.
```

## View a LUN move session

### Format

```
/move/session [-id <value>] show
```

### Object qualifier

| Qualifier | Description                      |
|-----------|----------------------------------|
| -id       | Type the ID of the move session. |

## Example

The following command displays details for a LUN move session.

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /move/session show -detail
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

1: ID = movesession_1
 Source resource = sv_1
 Source member LUN =
 Destination pool = pool_1
 State = Initializing
 Progress = 0%
 Health state = OK
 Health details = "The component is operating normally. No action is
required."
 Priority = Normal
```



```

Average transfer rate = 0 MB/s
Current transfer rate = 0 MB/s
Estimated time left = N/A

2: ID = movesession_2
 Source resource = res_1
 Source member LUN = lun_2
 Destination pool = pool_2
 State = Running
 Progress = 17%
 Health state = OK
 Health details = "The component is operating normally. No action is
required."
 Priority = Above Normal
 Average transfer rate = 147 MB/s
 Current transfer rate = 232 MB/s
 Estimated time left = 7m

```

## Change LUN move session settings

### Format

```

/move/session -id <value> set [-priority {idle | low | below | normal | above | high}]
[-async]

```

### Object qualifier

| Qualifier | Description                      |
|-----------|----------------------------------|
| -id       | Type the ID of the move session. |

### Action qualifiers

| Qualifier | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|-----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| -priority | Specify the priority of the move session. Valid values are: <ul style="list-style-type: none"> <li>idle—Designated for move sessions that continue to mirror the host I/O.</li> <li>low—Designated for move sessions that have the least priority over other move sessions.</li> <li>below—Designated for move sessions that are slightly less critical than the average or normal move session.</li> <li>normal (default)—Designated for move sessions that are appropriate for most use cases.</li> <li>above—Designated for move sessions that are slightly more critical than the average or normal move session.</li> <li>high—Designated for move sessions that take the highest priority over other move sessions.</li> </ul> |
| -async    | Run the operation in asynchronous mode.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |

### Example

The following command modifies the settings of a move session.

```

uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /move/session -id MoveSession_1 set -
priority below

```

```

Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

```

```
ID = MoveSession_1
Operation completed successfully.
```

## Delete a LUN move session

Deletes a LUN move session that was completed, cancelled, or failed. You cannot delete a move session that is in progress.

### Format

```
/move/session -id <value> delete [-async]
```

### Object qualifier

| Qualifier | Description                      |
|-----------|----------------------------------|
| -id       | Type the ID of the move session. |

### Action qualifier

| Qualifier | Description                             |
|-----------|-----------------------------------------|
| -async    | Run the operation in asynchronous mode. |

### Example

The following command deletes a move session.

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /move/session -id movesession_1 delete
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection
```

```
Operation completed successfully
```

## Cancel a LUN move session

Cancels a LUN move session that is in progress.

### Format

```
/move/session -id <value> cancel [-async]
```

### Object qualifier

| Qualifier | Description                      |
|-----------|----------------------------------|
| -id       | Type the ID of the move session. |

## Action qualifier

| Qualifier | Description                             |
|-----------|-----------------------------------------|
| -async    | Run the operation in asynchronous mode. |

## Example

The following command cancels a move session.

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /move/session -id movesession_1 cancel
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection
```

```
Operation completed successfully.
```

# Manage Events and Alerts

This chapter contains the following topics:

## Topics:

- [View event logs and alerts](#)
- [Configure alert settings](#)
- [Configure SNMP destinations for alerts](#)

## 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 drive has faulted, or that the system is low on storage capacity.

In Unisphere, events appear as messages and alerts. The Unisphere CLI displays additional event attributes that provide more detailed event reports than what appears in Unisphere. [Configure alert settings](#) on page 521 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.

The following table lists the attributes for event records:

**Table 137. Event record attributes**

| Attribute   | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|-------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Message ID  | ID of the event record.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| Description | Brief description of the event.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Severity    | Severity of the event. Valid values are: <ul style="list-style-type: none"> <li>• <code>info</code> – Some event has occurred that does not have an impact on the functioning of the system.</li> <li>• <code>notice</code> – An important event has occurred that does not have an impact on the functioning of the system.</li> <li>• <code>warning</code> – An error has occurred that you should be aware of but has not had a significant impact on the system.</li> <li>• <code>error</code> – 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>• <code>critical</code> – An error has occurred that has a significant impact on the system and should be remedied immediately.</li> </ul> |
| Time        | Date and time when the event occurred, in Greenwich Mean Time (GMT).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Node        | Name of the SP that generated the event. Valid values are: <ul style="list-style-type: none"> <li>• <code>spa</code></li> <li>• <code>spb</code></li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Process     | ID of the system process that generated the event.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Category    | Event category. <p> <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 <i>authentication</i> value will appear twice, as there are separate events for successful login and authentication.</p>                                                                                                                                                                                                                                                                                                                                                                                                                     |

**Table 137. Event record attributes (continued)**

| Attribute | Description                                                                                                                         |
|-----------|-------------------------------------------------------------------------------------------------------------------------------------|
| Account   | User account of the user that caused the event. <i>N/A</i> 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.                                                               |

**Table 138. Alert attributes**

| Attribute    | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|--------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ID           | ID of the alert.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| Time         | Date and time (in GMT) when the alert occurred.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Message      | Alert message.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Description  | Description of a problem.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Severity     | Alert severity. Valid values are: <ul style="list-style-type: none"> <li>• <code>info</code> – Some event has occurred that does not have an impact on the functioning of the system.</li> <li>• <code>notice</code> – An important event has occurred that does not have an impact on the functioning of the system.</li> <li>• <code>warning</code> – An error has occurred that you should be aware of but has not had a significant impact on the system.</li> <li>• <code>error</code> – 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>• <code>critical</code> – An error has occurred that has a significant impact on the system and should be remedied immediately.</li> </ul> |
| Acknowledged | Indicates whether or not the alert was acknowledged. Valid values are: <ul style="list-style-type: none"> <li>• <code>yes</code></li> <li>• <code>no</code></li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| State        | Displays the alert state for each alert. Values are: <ul style="list-style-type: none"> <li>• <code>Active_Auto</code> – Active alerts that will be automatically cleared once resolved.</li> <li>• <code>Active_Manual</code> – Active alerts that must be manually cleared using the <code>/event/alert/hist deactivate</code> command after being resolved.</li> <li>• <code>Inactive</code> – Alerts that are already resolved.</li> <li>• <code>Updating</code> – Alerts transitioning between the other states.</li> </ul>                                                                                                                                                                                                                                                              |

## 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 21 explains how to change the output format.

## Format

```
/event/log show [-fromTime <value>] [-toTime <value>] [-limit <value>] [-severity {info | notice | warning | error | critical}]
```

## 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> <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> <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"
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

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. When a new alert comes in, those alerts older than seven days will be cleared..

## Format

```
/event/alert/hist show [-state {Active_Manual | Active_Auto | Inactive | Active_Updating | All}] [-fromTime <value>] [-toTime <value>] [-limit <value>] [-acknowledged { yes | no }] [-severity {info | notice | warning | error | critical}]
```

## 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> <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> <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.                                                                                                                                                                                                              |

| Qualifier     | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|---------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| -acknowledged | Type to specify a list of alerts that have or have not been acknowledged. Valid values are: <ul style="list-style-type: none"> <li>• yes</li> <li>• no</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| -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.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| -state        | Specify the state of the alerts that you want to display. If this option is not specified, only active alerts will be displayed. Valid values are: <ul style="list-style-type: none"> <li>• Active_Auto - Displays all active alerts that will be automatically cleared once resolved.</li> <li>• Active_Manual - Displays all active alerts that must be manually cleared using the <code>/event/alert/hist deactivate</code> command once resolved.</li> <li>• Inactive - Displays all resolved or deactivated alerts.</li> <li>• Active_Updating - Displays all alerts transitioning between states.</li> <li>• All - Displays all active and inactive alerts.</li> </ul> |

## Example

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /event/alert/hist -state Active_Manual show
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection
1: Id = alert_3
 Time = 2016-03-01 17:30:00.309
 Message = System contact information requires verification.
 Description = "Please verify your system contact information. This will help your
service provider to contact you and quickly respond to any critical issues. (https://
10.108.53.216/help/webhelp/en_US/index.htm?vxeuni_c_configure_alert_settings.html)"
 Severity = info
 Acknowledged = no
 State = Active_Manual

2: Id = alert_2
 Time = 2016-03-01 15:19:39.115
 Message = There are new advisories available for viewing on the Technical
Advisories page.
 Description = "There are one or more new technical advisories available for
viewing on the Technical Advisories page."
 Severity = notice
 Acknowledged = no
 State = Active_Manual

3: Id = alert_1
 Time = 2016-03-01 14:53:05.094
 Message = System FCNCH0972C35D9 has experienced one or more problems that
have left it in a degraded state
 Description = "The system has experienced one or more
failures resulting in degraded system performance. Check related alerts
and fix the underlying problems. (https://10.108.53.216/help/webhelp/en_US/index.htm?
#vxeuni_t_fix_underlying_problems.html)"
 Severity = warning
 Acknowledged = no
 State = Active_Manual
```

## Acknowledge alerts

Acknowledge specific alerts.

## Format

```
/event/alert/hist -id <value> ack
```

## Object qualifier

| Qualifier | Description                                               |
|-----------|-----------------------------------------------------------|
| -id       | Type the identifier of the alert you want to acknowledge. |

## Example

The following command acknowledges alert\_2.

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /event/alert/hist -id alert_2 ack
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

Operation completed successfully.
```

## Delete alerts

Delete specific alerts.

## Format

```
/event/alert/hist -id <value> delete
```

## Object qualifier

| Qualifier | Description                                          |
|-----------|------------------------------------------------------|
| -id       | Type the identifier of the alert you want to delete. |

## Example

The following command deletes alert\_3.

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /event/alert/hist -id alert_3 delete
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

Operation completed successfully.
```

## Deactivate alerts

Manually deactivate an alert that is in the *Active\_Manual* state after it has been resolved.

## Format

```
/event/alert/hist -id <value> deactivate
```



## Object qualifier

| Qualifier | Description                       |
|-----------|-----------------------------------|
| -id       | Type the identifier of the alert. |

## Example

The following example shows how to deactivate *alert\_1*, which is in the *Active\_Manual* state, after it has been resolved. It is recommended that you do not deactivate alerts where the issue has not yet been resolved. Deactivated alerts cannot be reactivated, so do not deactivate the alert if you are not sure whether or not it has been resolved.

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /event/alert/hist -id alert_1 deactivate
```


```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection
```

```
You should only deactivate an alert when the issue has been solved. Once the alert has
been deactivated, it can't be activated again. Do you want to proceed?
yes / no: yes
```

```
Operation completed successfully.
```

## 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 527 provides more details on setting up a destination to receive alerts over SNMP. [View event logs and alerts](#) on page 516 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 203.

The following table lists the attributes for alerts:

**Table 139. Alert attributes**

| Attribute                      | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|--------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Language                       | Language in which the system sends e-mail alerts.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| E-mail from address            | The email address from which alert emails will be sent.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| SNMP severity threshold        | Minimal severity of alerts the system will send as SNMP traps. Valid values are: <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>notice — An important event has occurred that does not have an impact on the functioning of 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.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Show all pool threshold alerts | Indicates whether the pool space usage percent threshold alerts are enabled. Values are: <ul style="list-style-type: none"><li>yes</li></ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |

**Table 139. Alert attributes (continued)**

| Attribute                        | Description                                                                                                                                                                                     |
|----------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                  | <ul style="list-style-type: none"> <li>no</li> </ul> <p><b>NOTE:</b> Regardless of whether this is enabled, alerts will always be sent for thinly provision pools that are over-subscribed.</p> |
| Call home suppression start time | Date and time when the call home suppression is started.                                                                                                                                        |
| Call home suppression end time   | Data and time when the call home suppression ends.                                                                                                                                              |

## View alert settings

View the settings for how the system handles alerts.

### Format

```
/event/alert/conf show
```

### Example

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

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

1: Language = en-US
 SNMP severity threshold = Info
 SNMP version = 3.0
 SNMP engine ID =
 Show all pool threshold alerts = no
 Call home suppression start time= 2017-04-10 00:00:00
 Call home suppression end time = 2017-04-12 00:00:00
```

## 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 203.

### Format

```
/event/alert/conf set [-emailFromAddr <value>] [-snmpSeverity {critical|error|warning|notice|info}] [-showAllPoolThresholdAlerts {yes | no}] [{-callHomeSuppressionEndTime <value> | -stopCallHomeSuppression}]
```

### Action qualifiers

| Qualifier       | Description                                                     |
|-----------------|-----------------------------------------------------------------|
| -emailFromAddrs | Specify the email address from which alert emails will be sent. |

| Qualifier                   | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|-----------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| -snmpSeverity               | Specify the minimal severity of alerts the system will send as SNMP traps. Values are: <ul style="list-style-type: none"> <li>critical</li> <li>error</li> <li>warning</li> <li>notice</li> <li>info</li> </ul>                                                                                                                                                                                                                                                                                                                                                        |
| -showAllPoolThresholdAlerts | Specify whether the alert was generated due to an exceeded pool threshold. Valid values are: <ul style="list-style-type: none"> <li>yes</li> <li>no</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                         |
| -callHomeSuppressionEndTime | Specify the date and time when the call home suppression window will end. The total suppression window is the time between the current time and the suppression end time, or the start time and suppression end time for open suppression windows. The suppression window can be in one minute increments between 1 and 48 hours. <p> <b>NOTE:</b> Use this option to temporarily suppress call home alerts when you are intentionally performing service actions on your system.</p> |
| -stopCallHomeSuppression    | Specify to disable call home suppression.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |

## Example 1

The following command changes these alert settings:

- From address is "from@email.com".
- 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 -emailFromAddr "from@mail.com" -snmpSeverity error
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

Operation completed successfully.
```

## Example 2

The following command sets the end time for call home alert suppression:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /event/alert/conf set -stopCallHomeSuppression
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

Operation completed successfully.
```

## Configure alert email settings

Specify the alert email settings.

**Table 140. Alert email attributes**

| Attribute | Description                                  |
|-----------|----------------------------------------------|
| ID        | Identifier of the alert email configuration. |

**Table 140. Alert email attributes (continued)**

| Attribute          | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|--------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Address            | The email address from which alert emails will be sent.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Severity threshold | Minimal severity of alerts the system will send emails for. Valid values are: <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>notice — An important event has occurred that does not have an impact on the functioning of the system.</li><li>info — Some event has occurred that does not have an impact on the functioning of the system.</li></ul> |

## Configure alert email settings

Configure the "email to" settings for alerts.

### Format

```
/event/alert/conf/emailto create -addr <value> [-severity {critical | error | warning | notice | info}]
```

### Action qualifier

| Qualifier | Description                                                                                                                                                                                                     |
|-----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| -addr     | Type an e-mail address to send alerts to.                                                                                                                                                                       |
| -severity | Specify the minimum severity of alerts that will trigger emails. Valid values are: <ul style="list-style-type: none"><li>critical</li><li>error</li><li>warning</li><li>notice (default)</li><li>info</li></ul> |

### Example

This example shows the configuration of the "to" email address of "stuff1@mail.com" and a severity of "info".

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /event/alert/conf/emailto create -addr stuff1@mail.com -severity info
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection
```

```
ID = alertEmailConfig_1
Operation completed successfully.
```

## Change email alert settings

Change the current configuration for the alert "email to".

## Format

```
/event/alert/conf/emailto { -id <value> | -addr <value> } set [-newAddr <value>] [-severity { info | notice | warning | error | critical }]
```

## Object qualifier

| Qualifier | Description                                                                                             |
|-----------|---------------------------------------------------------------------------------------------------------|
| -id       | Type the ID of the alert configuration you want to modify.                                              |
| -addr     | Type the address of the "email to" address for which you would like to change the alert email settings. |

## Action qualifier

| Qualifier | Description                                                                                                                                                                                                          |
|-----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| -newAddr  | Type a new email address to send alerts to.                                                                                                                                                                          |
| -severity | Type the new the minimum severity of alerts that will trigger emails. Valid values are: <ul style="list-style-type: none"><li>• critical</li><li>• error</li><li>• warning</li><li>• notice</li><li>• info</li></ul> |

## Example

The following command changes the alert "email to" address to "stuff1@newmail.com" and specifies the severity level of alerts that will trigger the email is "info".

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /event/alert/conf/emailto -addr stuff1@mail.com set -newAddr stuff1@newmail.com -severity info
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

ID = alertEmailConfig_1
Operation completed successfully.
```

## View alert email settings

View the "email to" settings for alerts.

## Format

```
/event/alert/conf/emailto [{ -id <value> | -addr <value>}] show
```

## Object qualifier

| Qualifier | Description                                                                                        |
|-----------|----------------------------------------------------------------------------------------------------|
| -id       | Type the ID of the alert configuration you want to view.                                           |
| -addr     | Type the address of the "email to" address for which you would like view the alert email settings. |

### Example

This example shows the configuration of all of the alert emails on the system.

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /event/alert/conf/emailto show
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

1: ID = alertEmailConfig_1
 Address = stuff1@mail.com
 Severity threshold = Info

2: ID = alertEmailConfig_2
 Address = stuff2@mail.com
 Severity threshold = Notice

3: ID = alertEmailConfig_3
 Address = stuff3@mail.com
 Severity threshold = Notice
```

### Test email alert settings

Send a test email to all of the email addresses configured to receive alert notifications.

#### Format

```
/event/alert/conf testEmailAlert
```

### Example

The following example demonstrates how to test alert email settings.

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /event/alert/conf testEmailAlert
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

Operation completed successfully.
```

### Delete email alert settings

Delete alert email configurations.

#### Format

```
/event/alert/conf/emailto -id <value> delete
```

#### Object qualifier

| Qualifier | Description                                                |
|-----------|------------------------------------------------------------|
| -id       | Type the ID of the alert configuration you want to delete. |

## Example

The following command changes the alert "email to" address to "stuff1@newmail.com" and specifies the severity level of alerts that will trigger the email is "info".

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /event/alert/conf/emailto -id alertEmailConfig_1 delete
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

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.

The following table lists the attributes for SNMP destinations:

**Table 141. 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 destination

Create an SNMP trap destination for system alerts.

## Format

```
/event/alert/snmp create -host <value> -port <value> -userName <value> [-authProto
{ none | md5 { -authPassword <value> | -authPasswordSecure } [-privProto { none |
aes { -privPassword <value> | -privPasswordSecure } | des { -privPassword <value> | -
privPasswordSecure } }] | sha { -authPassword <value> | -authPasswordSecure } [-privProto
{ none | aes { -privPassword <value> | -privPasswordSecure } | des { -privPassword <value>
| -privPasswordSecure } }] }] | -v2c -community <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.                                                                                                                                                                                                                                            |
| -authPasswordSecure | Specify the password in secure mode. The user will be prompted to input the 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.                                                                                                                                                                                                                                                   |
| -privPasswordSecure | Specify the password in secure mode. The user will be prompted to input the password.                                                                                                                                                                                        |
| -v2c                | Specify that an SNMP v2c destination will be created.                                                                                                                                                                                                                        |
| -community          | Specify the SNMP v2c destination community string.                                                                                                                                                                                                                           |

## 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
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection
```



```
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 21 explains how to change 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
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

1: ID = snmp_target_1
 Version = v3
 Host = 10.0.1.3
 Port = 123
 User name = v3User
 Auth protocol = None
 Privacy protocol = None
 Community =

2: ID = snmp_target_2
 Version = v2c
 Host = 10.0.1.3
 Port = 879
 User name =
 Auth protocol =
 Privacy protocol =
 Community = v2CommunityStr
```

## 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> | -authPasswordSecure } [-privProto
{ none | aes { -privPassword <value> | -privPasswordSecure } | des { -privPassword
<value> | -privPasswordSecure } }] | sha { -authPassword <value> | -authPasswordSecure }
[-privProto { none | aes { -privPassword <value> | -privPasswordSecure } | des { -
privPassword <value> | -privPasswordSecure } }] }] [-community <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.                                                                                                                                                                                                                                            |
| -authPasswordSecure | Specify the password in secure mode. The user will be prompted to input the 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.                                                                                                                                                                                                                                                   |
| -privPasswordSecure | Specify the password in secure mode. The user will be prompted to input the password.                                                                                                                                                                                        |
| -community          | Specify the SNMP v2c destination community string.                                                                                                                                                                                                                           |

## 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
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection
```

```
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
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

Operation completed successfully.
```

# Service the System

This chapter contains the following topics:

## Topics:

- [Change the service password](#)
- [Service the system](#)
- [Manage core dump files](#)
- [Manage Service Information](#)
- [Manage SSH access](#)
- [Service the storage processor \(SP\)](#)

## Change the service password

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.

## Prerequisites

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> | -passwdSecure } { { -oldpasswd <value> | -oldpasswdSecure } | -force }
```

## Action qualifiers

| Qualifier        | Description                                                                                                                                                                                                                                                                                                                                                                                                       |
|------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| -passwd          | Type a new service password. 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> |
| -passwdSecure    | Specify the password in secure mode - the user will be prompted to input the password and the password confirmation.                                                                                                                                                                                                                                                                                              |
| -oldpasswd       | Type the old password to set the new password.                                                                                                                                                                                                                                                                                                                                                                    |
| -oldpasswdSecure | Specify the password in secure mode - the user will be prompted to input the password.                                                                                                                                                                                                                                                                                                                            |
| -force           | Specify whether it is a password modification request or a password reset request. This is intended to be used by service user only.                                                                                                                                                                                                                                                                              |

## Example

The following command changes the service password. Note that this can only be executed in normal mode:

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

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

Operation completed successfully.
```

## Service the system

Apply service action to the system. This command must be executed with service user credentials.

### Restart management software

Restarts management software on the system. Can be executed in normal mode only.

#### Format

```
/service/system restart
```

#### Example

The following command restarts system management software:


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

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

Operation completed successfully.
```

## Shut down the system

Shuts down the system.

 **NOTE:** This command can be executed in normal mode only.

#### Format

```
/service/system shutdown
```

#### Example

The following command shuts down the system (in normal mode only):

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

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection
```

```
Operation completed successfully.
```

## Reinitialize the system

Reinitialize the storage system. The system should be in the service mode to execute this action.

### Format

```
/service/system reinit
```

### Example

The following command reinitializes the storage system:

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

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection
Operation completed successfully.
```

## Collect service information

Collect information about the system and save it to a file. The file may then be downloaded using the `uemcli -download` command. (See [View the switches](#) on page 27).

### Format

```
/service/system collect {-serviceInfo [-type {full | perfAssessment | perfTrace}] | -config [-showPrivateData]}
```

### Action qualifiers

| Qualifier        | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| -serviceInfo     | Collect information about the system and save it to a .tar file. Service providers can use the collected information to analyze the system.                                                                                                                                                                                                                                                                                                                                         |
| -type            | Specify the type of service information to collect. Valid values are: <ul style="list-style-type: none"><li>• <code>full</code>(default)—Collect the full set of service information.</li><li>• <code>perfAssessment</code>—Collect service information for doing a performance assessment.</li><li>• <code>perfTrace</code>—Collect service information for doing a trace.</li><li>• <code>minimum</code>—Collect a minimum set of service information (log files only).</li></ul> |
| -config          | Create a snapshot of the current system configuration and save it to a file. It captures all of the data necessary to recreate the current configuration on a new or reinitialized system. It does not capture log files or other types of diagnostic data.                                                                                                                                                                                                                         |
| -showPrivateData | Include sensitive information (such as IP addresses) into the collected data.                                                                                                                                                                                                                                                                                                                                                                                                       |

### Example 1

The following command collects information about the system and saves it to a file:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /service/system collect -serviceInfo
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

Operation completed successfully.
```

## Example 2

The following command collects service information about system performance and saves it to a file.

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /service/system collect -serviceInfo -
type perfAssessment
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

Operation completed successfully.
```

# Manage core dump files

Manage the list of core dump files, which contain system information used by support for troubleshooting.

Core dump files are generated by the system whenever there is an SP failure. Core dump files are used by support to help troubleshoot and resolve issues.

**Table 142. Core dump attributes**

| Attribute     | Description                                               |
|---------------|-----------------------------------------------------------|
| ID            | Indicates the unique identifier of the core dump file.    |
| Name          | Name of the core dump file.                               |
| Creation time | Date and time when the core dump file was generated.      |
| File size     | Total size of all the core dump files in the dump folder. |

## View core dumps

View a list of core dump files generated by the system for both SPs. The files may be downloaded using the `uemcli -download` command. (See [View the switches](#) on page 27).

## Format

```
/service/system/dump [-id <value>] show
```

## Object qualifier

| Qualifier | Description                                            |
|-----------|--------------------------------------------------------|
| -id       | Indicates the unique identifier of the core dump file. |

## Example

The following command shows a list of the system core dumps.

```
uemcli -d 10.0.0.1 -u local/serviceuser -p Password /service/system/dump -id
"mspb:logDaemon_:2017-03-15_07_34_54_878_logDaemon.x" show

Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

1: ID = mspb:logDaemon_:2017-03-15_07_34_54_878_logDaemon.x
 Name =
logDaemon_dump_spb_FCNCH097052190_2017-03-15_07_34_54_878_logDaemon.x_dir
 Creation time = 2017-03-15 07:34:54.000
 File size = 126MB
```

## Delete core dumps

Delete a core dump file from the list of core dumps generated by the system.

### Format

```
/service/system/dump {-id <value>} delete
```

### Object qualifier

| Qualifier | Description                                                        |
|-----------|--------------------------------------------------------------------|
| -id       | Specify the unique identifier of the core dump file to be deleted. |

### Example

The following command deletes a core dump by specifying its name.

```
uemcli -d 10.0.0.1 -u local/serviceuser -p Password /service/system/dump -id
mspa:CP_:2016-06-22_15_13_20_19151_ECOM delete

Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

Operation completed successfully.
```

## Manage Service Information

Manage and list the service information files that have been generated on your system.

Table 143. Service information file attributes

| Attribute     | Description                                                      |
|---------------|------------------------------------------------------------------|
| ID            | Indicates the unique identifier of the service information file. |
| Name          | Name of the service information file.                            |
| Creation time | Date and time when the service information file was generated.   |
| File size     | Total size of all the service information files on the system.   |



# View service information file list

View the list of service information files generate on your system.

To download the service information files, use the `uemcli -download` command. See the [View Switches](#) section for detailed usage.

## Format

```
/service/system/serviceInfo [-id <value>] show
```

## Object qualifier

| Qualifier | Description                                                                 |
|-----------|-----------------------------------------------------------------------------|
| -id       | Optionally specify the ID of the service information file you want to view. |

## Example

The following example shows the list of service information files.

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /service/system/serviceInfo show
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

1: ID = m2018-12-31_20_19_02:spa__VNxe3200
 Name = spa__VNxe3200_service_data_FCNCH097274951_2018-12-31_20_19_02.tar
 Creation time = 2018-12-31T20:23:35.000Z
 File size = 100MB
```

# Manage SSH access

Manage SSH (Secure shell) access to the system. This command must be executed with service user credentials.

## Set SSH access

Manage SSH access to the system.

## Format

```
/service/ssh set -enabled {yes | no}
```

## Action qualifiers

| Qualifier | Description                                                                                                                                                                                   |
|-----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| -enabled  | Flag indicating whether the SSH access is enabled. The following are the password requirements. Value is one of the following: <ul style="list-style-type: none"><li>yes</li><li>no</li></ul> |

## Example

The following command enables SSH access to the system:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /service/ssh set -enabled yes
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

Operation completed successfully.
```

## View SSH settings

Displays SSH settings.

### Format

```
/service/ssh show
```

## Example

The following command displays SSH settings:

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

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

1: SSH enabled = yes
```

# Service the storage processor (SP)

Allows user to apply service action to the storage processor. This command must be executed with service user credentials.

## Enter service mode

Switch the storage processor to the service mode.This command can only be executed in normal mode.

### Format

```
/service/sp -id <value> service
```

### Object qualifier

| Qualifier | Description                       |
|-----------|-----------------------------------|
| -id       | Identifies the storage processor. |

## Example

The following command enters the service mode:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /service/sp -id spa service
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

Operation completed successfully.
```

## Reboot

Reboot the storage processor.

### Format

```
/service/sp -id <value> reboot
```

### Object qualifier

| Qualifier | Description                       |
|-----------|-----------------------------------|
| -id       | Identifies the storage processor. |

### Example

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /service/sp -id spa reboot
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

Operation completed successfully.
```

## Reimage

Reimage the storage processor.

### Format

```
/service/sp -id <value> reimage
```

### Object qualifier

| Qualifier | Description                       |
|-----------|-----------------------------------|
| -id       | Identifies the storage processor. |

### Example

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /service/sp -id spa reimage
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection
```

Operation completed successfully.

# Manage Metrics

This chapter contains the following topics:

## Topics:

- [Manage metrics service](#)
- [Manage metrics settings](#)
- [Manage historical metrics values](#)
- [Manage real-time metrics values](#)

## Manage metrics service

Storage system metrics gather information about system performance and storage usage, and collect that information for user review. Analyzing the system metrics can help predict the future growth of the system.

Historical and real-time metrics values are available in predefined intervals. High frequency (short interval) metric values are not kept as long as low frequency (long interval) metrics.

The following table lists the metrics service attributes:

**Table 144. Metrics service attributes**

| Attribute         | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|-------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| History enabled   | Indicates whether historical metrics collection is enabled. Value is one of the following: <ul style="list-style-type: none"> <li>• yes</li> <li>• no</li> </ul> Default value is yes.                                                                                                                                                                                                                                                                                                                                                                                                           |
| History retention | Identifies the timestamp of the earliest available value for each frequency interval. The formats are: <ul style="list-style-type: none"> <li>• YYYY-MM-DD HH:MM:SS (60 sec)</li> <li>• YYYY-MM-DD HH:MM:SS (300 sec)</li> <li>• YYYY-MM-DD HH:MM:SS (3600 sec)</li> <li>• YYYY-MM-DD HH:MM:SS (14400 sec)</li> </ul> If the data for a certain interval is not available, the system displays not available instead of a timestamp. <p><b>NOTE:</b> By default, the timestamps are UTC time. If you specify a timezone offset with <code>-gmtoff</code>, the timestamps adjust accordingly.</p> |

## View metrics service settings

View the current metrics service settings.

**NOTE:** Use the show action command to change the output format.

### Format

```
/metrics/service show
```

## Example

The following command displays the metrics service settings for the system:

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

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection


1: History enabled = yes
 History retention= 2012-9-20 12:00:00 (60 sec), 2012-9-14 12:00:00 (300 sec), not
 available (3600 sec), not available (14400 sec)
```

## Configure metrics service


Enable historical metrics collection.

### Format

```
/metrics/service set -historyEnabled { yes | no }
```

 **NOTE:** Only administrators are allowed to run this command.

### Action qualifiers

| Qualifier       | Description                                                                                                                                                                                                                                                                                                                   |
|-----------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| -historyEnabled | Indicates whether historical metrics collection is enabled or disabled. Value is one of the following: <ul style="list-style-type: none"><li>yes</li><li>no</li></ul>  <b>NOTE:</b> The system prompts for confirmation if you specify no. |

## Example

The following command enables metrics collection:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /metrics/service set -historyEnabled yes
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

Operation completed successfully.
```

## Manage metrics settings

Storage system metrics gather information about system performance and storage usage, and collect that information for user review. Analyzing the system metrics can help predict the future growth of the system.

The following table lists the metrics attributes:

**Table 145. Metrics attributes**

| Attribute    | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|--------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Path         | <p>Unique ID for the metric.</p> <p><b>i</b> <b>NOTE:</b> Metrics are usually associated with objects. This association is reflected by a * character in the metric path, such as <b>sp.*.net.device.*.bytes</b>, which is associated with two objects, SP and network device. The metrics commands will accept a metric path with the * replaced by an object, and return only the result for the specified object. The system generates an error if the specified object is not valid.</p> |
| Description  | Description of the metric.                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Type         | <p>Metric type. Valid values are:</p> <ul style="list-style-type: none"> <li>• <code>rate</code> — A counter difference relative to a unit of time.</li> <li>• <code>counter</code> — A monotonically increasing, unsigned quantity.</li> <li>• <code>fact</code> — Represents point-in-time information. Fact values should be expected to go up and down.</li> <li>• <code>64 bits counter</code> — A counter of 64 bits.</li> <li>• <code>text</code> — Literal.</li> </ul>               |
| Unit         | Unit measure for the metric.                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Availability | <p>Availability of the metric. Value is one of the following:</p> <ul style="list-style-type: none"> <li>• <code>historical</code> — The metric is included in historical metrics collection.</li> <li>• <code>real-time</code> — The metric supports real-time subscription.</li> <li>• <code>historical, real-time</code> — The metric supports both historical and real-time collection.</li> </ul> <p>This attribute does not apply to family, set, and compound metrics.</p>            |

## View metrics settings

View information about supported metrics.

**i** **NOTE:** Use the show action command to change the output format.

### Format

```
/metrics/metric [-path <value>] [-availability { historical | real-time }] show
```

### Object qualifier

| Qualifier     | Description                                                                                                                                                                                                                                |
|---------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| -path         | <p>Specify a comma-separated list of metric paths.</p> <p><b>i</b> <b>NOTE:</b> When typing metric paths, replace . with \., , with \, and \ with \\ in the object names.</p> <p>Omitting this switch specifies all available metrics.</p> |
| -availability | <p>Specify a type of metric to display. Value is one of the following:</p> <ul style="list-style-type: none"> <li>• <code>historical</code></li> <li>• <code>real-time</code></li> </ul>                                                   |

| Qualifier | Description                                |
|-----------|--------------------------------------------|
|           | Omitting this switch displays all metrics. |

## Example 1

The following command displays all available metric service settings for the system:

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

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

1: Path = sp.*.cifs.global.basic.readsRate
2: Path = sp.*.cifs.global.basic.totalCallsRate
3: Path = sp.*.cifs.global.basic.writeAvgSize
```

## Example 2

The following command displays all available metric service settings for the system with additional details:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /metrics/metric show -detail
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

1: Path = sp.*.blockCache.global.summary.cleanPages
 Description = Number of Clean Pages on SP, based on a logical
 64 KB page size
 Type = fact
 Unit = Count
 Availability = real-time

2: Path = sp.*.blockCache.global.summary.dirtyBytes
 Description = Amount of Dirty Data (MB) on SP
 Type = fact
 Unit = MB
 Availability = historical, real-time

3: Path = sp.*.blockCache.global.summary.dirtyPages
 Description = Number of Dirty Pages on SP, based on a logical
 64 KB page size
 Type = fact
 Unit = Count
 Availability = real-time
```

## Example 3

The following command displays all available real-time metric service settings for the system:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /metrics/metric -availability real-time show
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

439: Path = sp.*.storage.pool.*.sizeTotal
440: Path = sp.*.storage.pool.*.sizeUsed
```



```

441: Path = sp.*.storage.pool.*.sizeUsedBlocks
442: Path = sp.*.storage.pool.*.snapshotSizeSubscribed
443: Path = sp.*.storage.pool.*.snapshotSizeUsed
444: Path = sp.*.storage.summary.readBlocksRate
445: Path = sp.*.storage.summary.readBytesRate
446: Path = sp.*.storage.summary.readsRate
447: Path = sp.*.storage.summary.totalBytesRate

```

## Example 4

The following command displays the metrics service settings for the metrics with the specified paths:

```

uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /metrics/metric -path
sp.*.storage.lun.*.avgReadSize,sp.*.storage.filesystem.*.writesRate,sp.*.cifs.smb2.basic.re
adsRate show -detail

```

```

Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

1: Path = sp.*.storage.lun.*.avgReadSize
 Description = Average read size on this LUN
 Type = fact
 Unit = KB
 Availability = historical, real-time

2: Path = sp.*.storage.filesystem.*.writesRate
 Description = Rate of sp.*.storage.filesystem.*.writes
 Type = rate
 Unit = Requests/s
 Availability = historical, real-time

3: Path = sp.*.cifs.smb2.basic.readsRate
 Description = Rate of sp.*.cifs.smb2.basic.reads
 Type = rate
 Unit = Ops/s
 Availability = real-time

```

## Manage historical metrics values

Storage system metrics gather information about system performance and storage usage, and collect that information for user review. Analyzing the system metrics can help predict the future growth of the system.

Historical metric values are available in predefined intervals. High frequency (short interval) metric values are not kept as long as low frequency (long interval) metrics.

The following table lists the historical metrics attributes:

**Table 146. Historical metrics attributes**


| Attribute | Description                                                                                                                                                                                    |
|-----------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Timestamp | Time when the metric value was collected. The format is: YYYY-MM-DD HH:MM:SS, where: <ul style="list-style-type: none"> <li>• YYYY — Year</li> <li>• MM — Month</li> <li>• DD — Day</li> </ul> |

**Table 146. Historical metrics attributes (continued)**

| Attribute          | Description                                                                                                 |
|--------------------|-------------------------------------------------------------------------------------------------------------|
|                    | <ul style="list-style-type: none"> <li>• HH — Hour</li> <li>• MM — Minute</li> <li>• SS — Second</li> </ul> |
| Dynamic attributes | Identifies the object name or metric value.                                                                 |

## View historical metrics settings




View historical metrics settings. The default output appears in a tabular format.

 **NOTE:** Use the show action command to change the output format.

### Format

```
/metrics/value/hist -path <value> show -interval { 60 | 300 | 3600 | 14400 } [-from
<value>] [-to <value>] [-count <value>] [-flat] [-summary]
```

### Object qualifier

| Qualifier | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|-----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| -path     | Specify a comma-separated list of metric paths.<br> <b>NOTE:</b> When typing metric paths, replace . with \., , with \, and \ with \\ in the object names.                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| -interval | Specify an interval for the metric values. Default interval is seconds.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| -from     | Specify the start of the query period. The format is: YYYY-MM-DD HH:MM:SS or YYYY-MM-DDTHH:MM:SS, where: <ul style="list-style-type: none"> <li>• YYYY — Year</li> <li>• MM — Month</li> <li>• DD — Day</li> <li>• T — Time delimiter</li> <li>• HH — Hour</li> <li>• MM — Minute</li> <li>• SS — Second</li> </ul>  <b>NOTE:</b> Ensure that the value is a time in the past. You can choose to specify just the date (in the YYYY-MM-DD format) or the time (in the HH:MM:SS format). If you do not specify the time, the system automatically uses 00:00:00. If you choose to not specify the date, the current system date is used. |
| -to       | Specify the end of the query period. The format is: YYYY-MM-DD HH:MM:SS or YYYY-MM-DDTHH:MM:SS, where: <ul style="list-style-type: none"> <li>• YYYY — Year</li> <li>• MM — Month</li> <li>• DD — Day</li> <li>• T — Time delimiter</li> <li>• HH — Hour</li> <li>• MM — Minute</li> <li>• SS — Second</li> </ul>  <b>NOTE:</b> Ensure that the value is a time in the past. You can choose to specify just the date (in the YYYY-MM-DD format) or the time (in the HH:MM:SS format). If you do not specify the time, the system automatically uses 00:00:00. If you choose to not specify the date, the current system date is used.   |

| Qualifier | Description                                                                                                                                                        |
|-----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| -count    | Specify the number of samples to display. A sample is a set of metric values related to a single timestamp. Valid values are numbers greater than or equal to one. |
| -flat     | Displays the member values for grouped metrics.                                                                                                                    |
| -summary  | Displays the maximum, minimum, and average value for each metric.                                                                                                  |

**NOTE:** The `-from` and `-to` qualifiers take precedence over the `-count` qualifier. In the example below, only 7 samples exist between the from and to dates. Although the value for the `-count` qualifier is set to 10, only 7 values appear. If the `-from` and `-to` qualifiers are not specified, the output will include 10 samples.

## Examples of output with different combinations of the -from, -to, and -count qualifiers

The following table illustrates the output that appears with combinations of the `-from`, `-to`, and `-count` qualifiers. It assumes that the current time is 2012-09-21 12:30:00.

| Qualifier Combination                                                                                                                                        | Output                                                                                                                                                                                                                                                                             |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <code>-from &lt;future date/time&gt;</code>                                                                                                                  | <b>Example:</b> <code>-from "2012-09-21 12:31:00"</code><br><b>Result:</b> This results in an error because the time for the <code>-from</code> qualifier is specified in the future.                                                                                              |
| <code>-from &lt;current date/time or date/time in the past&gt;</code><br><code>-to &lt;future date/time&gt;</code>                                           | <b>Example:</b> <code>-from "2012-09-01 00:00:00" -to "2012-09-21 12:31:00"</code><br><b>Result:</b> This results in an error because the time for the <code>-to</code> qualifier is specified in the future.                                                                      |
| <code>-from &lt;date/time in the past&gt; -count &lt;value&gt;</code>                                                                                        | <b>Example:</b> <code>-from "2012-09-20 01:02:00" -count 100</code><br><b>Result:</b> The result includes 100 samples from "2012-09-20 01:02:00". If there are less than 100 samples available, the result lists all samples from the specified time to the current time.          |
| <code>-from &lt;date/time in the past&gt;</code><br><code>-to &lt;current date/time or date/time in the past&gt;</code><br><code>-count &lt;value&gt;</code> | <b>Example:</b> <code>-from "2012-09-20 01:02:00" -to "20-09-20 12:00:00" -count 100</code><br><b>Result:</b> The result includes 100 samples within the specified time period. If there are less than 100 samples available, the result lists all samples within the time period. |
| <code>-to &lt;current date/time or date/time in the past&gt;</code><br><code>-count &lt;value&gt;</code>                                                     | <b>Example:</b> <code>-to "20-09-20 12:00:00" -count 100</code><br><b>Result:</b> The result includes the latest 100 samples before the specified time. If there are less than 100 samples available, the result lists all samples.                                                |
| <code>-count &lt;value&gt;</code>                                                                                                                            | <b>Example:</b> <code>-count 100</code><br><b>Result:</b> The result includes the latest 100 samples, or if there are less than 100 samples available, the result lists all samples.                                                                                               |
| <code>-to &lt;current date/time or date/time in the past&gt;</code>                                                                                          | <b>Example:</b> <code>-to "20-09-20 12:00:00"</code><br><b>Result:</b> The result includes all samples from the timestamp of the earliest sample to the specified time.                                                                                                            |
| <code>-from, -to, and -count are not specified.</code>                                                                                                       | <b>Result:</b> The result includes the latest 100 samples, or if there are less than 100 samples available, the result lists all samples. This is equivalent to <code>"-count 100"</code> .                                                                                        |

### Example 1

The following command displays the specified individual metric SPA LUN sv\_1 every 60 seconds during the query period:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /metrics/value/hist -path
sp.spa.storage.lun.sv_1.readsRate show -interval 60 -from "2014-06-24 02:12:00" -to
"2014-06-24 02:14:00"
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection
```

| Timestamp           | SP  | LUN  | Read<br>Counts/s |
|---------------------|-----|------|------------------|
| 2014-06-24 02:12:00 | spa | sv_1 | 4.001            |
| 2014-06-24 02:13:00 | spa | sv_1 | 2.400            |
| 2014-06-24 02:14:00 | spa | sv_1 | 9.602            |

## Example 2

The following command displays the specified metric, associated with a single object type, SPs, every 60 seconds during the query period:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /metrics/value/hist -path
sp.*.cpu.summary.utilization show -interval 60 -from "2014-06-24 02:57:00" -to "2014-06-24
02:59:10"
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection
```

| Timestamp           | SP  | summary<br>CPU<br>Util % |
|---------------------|-----|--------------------------|
| 2014-06-24 02:57:00 | spa | 12.62                    |
|                     | spb | 32.46                    |
| 2014-06-24 02:58:00 | spa | 13.06                    |
|                     | spb | 19.75                    |
| 2014-06-24 02:59:00 | spa | 13.44                    |
|                     | spb | 32.47                    |

## Example 3

The following command displays the specified metric, associated with two object types, SPs and LUNs, every 60 seconds during the query period:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /metrics/value/hist -path
sp.*.storage.lun.*.readsRate show -interval 60 -from "2014-06-24 02:59:00" -to "2014-06-24
03:01:00"
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection
```

| Timestamp           | SP  | LUN  | Read<br>Counts/s |
|---------------------|-----|------|------------------|
| 2014-06-24 02:59:00 | spa | sv_1 | 0.050            |
|                     | spa | sv_2 | 0                |
|                     | spb | sv_1 | 0                |
|                     | spb | sv_2 | 0.033            |
| 2014-06-24 03:00:00 | spa | sv_1 | 0.467            |
|                     | spa | sv_2 | 0                |
|                     | spb | sv_1 | 0                |
|                     | spb | sv_2 | 0.117            |
| 2014-06-24 03:01:00 | spa | sv_1 | 0.833            |
|                     | spa | sv_2 | 0                |
|                     | spb | sv_1 | 0                |

|     |      |  |       |
|-----|------|--|-------|
| spb | sv_2 |  | 0.467 |
|-----|------|--|-------|

## Example 4

The following command displays the specified metric, associated with three object types, SPs, pools, and LUNs, every 60 seconds during the query period:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /metrics/value/hist -path
sp.*.storage.pool.*.lun.*.dataSizeAllocated show -interval 60 -from "2014-06-24 03:04:00"
-to "2014-06-24 03:06:00"
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection
```

| Timestamp           | SP  | Pool Statistics | LUN  | Data Size Allocated Bytes |
|---------------------|-----|-----------------|------|---------------------------|
| 2014-06-24 03:04:00 | spa | pool_1          | sv_1 | 6442450944                |
|                     | spa | pool_1          | sv_2 | 8589934592                |
|                     | spb | pool_1          | sv_1 | 6442450944                |
|                     | spb | pool_1          | sv_2 | 8589934592                |
| 2014-06-24 03:05:00 | spa | pool_1          | sv_1 | 6442450944                |
|                     | spa | pool_1          | sv_2 | 8589934592                |
|                     | spb | pool_1          | sv_1 | 6442450944                |
|                     | spb | pool_1          | sv_2 | 8589934592                |
| 2014-06-24 03:06:00 | spa | pool_1          | sv_1 | 6442450944                |
|                     | spa | pool_1          | sv_2 | 8589934592                |
|                     | spb | pool_1          | sv_1 | 6442450944                |
|                     | spb | pool_1          | sv_2 | 8589934592                |

## Example 5

The following command displays metrics, associated with two object types, SPs and LUNs, and an individual metric associated with SPA, every 60 seconds during the query period:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /metrics/value/
hist -path sp.*.storage.lun.*.readsRate, sp.*.storage.lun.*.writesRate, sp.
spa.cpu.summary.utilization show -interval 60 -from "2014-06-24 03:04:00" -to "2014-06-24
03:06:00"
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection
```

| Timestamp           | SP  | LUN  | Read     | Write    | SP  | summary |
|---------------------|-----|------|----------|----------|-----|---------|
|                     |     |      | Counts/s | Counts/s |     | CPU     |
|                     |     |      |          |          |     | Util %  |
| 2014-06-24 03:10:00 | spa | sv_1 |          | 0        | spa | 12.63   |
|                     | spa | sv_2 | 1.050    | 9.066    |     |         |
|                     | spb | sv_1 | 0.067    | 9.350    |     |         |
|                     | spb | sv_2 | 0.100    | 14.95    |     |         |
| 2014-06-24 03:11:00 | spa | sv_1 |          | 0        | spa | 12.56   |
|                     | spa | sv_2 | 0.700    | 26.62    |     |         |
|                     | spb | sv_1 | 0.167    | 12.28    |     |         |
|                     | spb | sv_2 | 2.883    | 25.65    |     |         |
| 2014-06-24 03:12:00 | spa | sv_1 | 0.667    | 19.53    | spa | 12.12   |
|                     | spa | sv_2 | 0.333    | 26.87    |     |         |
|                     | spb | sv_1 | 7.066    | 3.700    |     |         |
|                     | spb | sv_2 | 7.066    | 3.383    |     |         |

## Example 6

The following command displays the member values for specified metrics every 60 seconds during the query period:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /metrics/value/hist -path
sp.*.cpu.summary.utilization show -interval 60 -from "2014-06-24 03:14:00" -to "2014-06-24
03:16:00" -flat
```

Storage system address: 10.0.0.1  
Storage system port: 443  
HTTPS connection

| Timestamp           | spa     |       | spb     |       |
|---------------------|---------|-------|---------|-------|
|                     | summary |       | summary |       |
|                     | CPU     |       | CPU     |       |
|                     | Util %  |       | Util %  |       |
| 2014-06-24 03:14:00 |         | 15.06 |         | 26.78 |
| 2014-06-24 03:15:00 |         | 15.82 |         | 29.39 |
| 2014-06-24 03:16:00 |         | 15.94 |         | 23.59 |

## Example 7

The following command displays the maximum, minimum, and average value for each metric every 60 seconds during the query period:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /metrics/value/hist -path
sp.*.cpu.summary.utilization show -interval 60 -from "2014-06-24 03:19:00" -to "2014-06-24
03:21:00" -summary
```

Storage system address: 10.0.0.1  
Storage system port: 443  
HTTPS connection

| Timestamp           | SP  |  | summary |       |
|---------------------|-----|--|---------|-------|
|                     |     |  | CPU     |       |
|                     |     |  | Util %  |       |
|                     |     |  |         |       |
| 2014-06-24 03:19:00 | spa |  |         | 17.72 |
|                     | spb |  |         | 43.52 |
| 2014-06-24 03:20:00 | spa |  |         | 15.35 |
|                     | spb |  |         | 37.82 |
| 2014-06-24 03:21:00 | spa |  |         | 15.08 |
|                     | spb |  |         | 36.32 |
| Summary             |     |  |         |       |
|                     | SP  |  | summary |       |
|                     |     |  | CPU     |       |
|                     |     |  | Util %  |       |
|                     |     |  |         |       |
| Minimum             | spa |  |         | 15.08 |
|                     | spb |  |         | 36.32 |
| Average             | spa |  |         | 16.05 |
|                     | spb |  |         | 39.22 |
| Maximum             | spa |  |         | 17.72 |
|                     | spb |  |         | 43.52 |

# Manage real-time metrics values

Storage system metrics gather information about system performance and storage usage, and collect that information for user review. Analyzing the system metrics can help predict the future growth of the system.


The following table lists the real-time metrics attributes.

**Table 147. Real-time metrics attributes**

| Attribute          | Description                                                                                                                                                                                                                                                       |
|--------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Timestamp          | Time when the metric value was collected. The format is: YYYY-MM-DD HH:MM:SS, where: <ul style="list-style-type: none"> <li>• YYYY — Year</li> <li>• MM — Month</li> <li>• DD — Day</li> <li>• HH — Hour</li> <li>• MM — Minute</li> <li>• SS — Second</li> </ul> |
| Dynamic attributes | Identifies the object name or metric value.                                                                                                                                                                                                                       |

## View real-time metrics settings


View real-time metrics settings. The default output appears in a tabular format.

 **NOTE:** Use the show action command to change the output format.


### Format

```
/metrics/value/rt -path <value> show -interval <value> [-to <value>] [-count <value>]
[-flat][-summary]
```

### Object qualifier

| Qualifier | Description                                                                                                                                                                                                                                   |
|-----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| -path     | Specify a comma-separated list of metric paths.<br> <b>NOTE:</b> When typing metric paths, replace . with \., , with \, and \ with \\ in the object names. |

### Action qualifier

| Qualifier | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|-----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| -interval | Specify an interval for the metric values. Default interval is seconds.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| -to       | Specify the end of the query period. The format is: YYYY-MM-DD HH:MM:SS or YYYY-MM-DDTHH:MM:SS, where: <ul style="list-style-type: none"> <li>• YYYY — Year</li> <li>• MM — Month</li> <li>• DD — Day</li> <li>• T — Time delimiter</li> <li>• HH — Hour</li> <li>• MM — Minute</li> <li>• SS — Second</li> </ul>  <b>NOTE:</b> Ensure that the value is a time in the past. You can choose to specify just the date (in the YYYY-MM-DD format) or the time (in the HH:MM:SS format). If you do not specify the time, the system automatically uses 00:00:00. If you choose to not specify the date, the current system date is used. |
| -count    | Specify the number of samples to display. A sample is a set of metric values related to a single timestamp. Valid values are numbers greater than or equal to one.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| -flat     | Displays the member values for grouped metrics.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |

| Qualifier | Description                                                       |
|-----------|-------------------------------------------------------------------|
| -summary  | Displays the maximum, minimum, and average value for each metric. |

**i NOTE:** Objects can come and go at any time, mostly due to object creation and deletion. In flat format, every time a new object is included, the title in tabular or CSV format or the attributes in NVP format is adjusted accordingly and reprinted as necessary on screen. If an object is no longer valid but it already has a column in tabular or CSV format, the column is kept only if its value becomes blank. Otherwise the object is not displayed anymore.

## Example 1

The following command displays the specified real-time metric every 10 seconds:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! uemcli /metrics/value/rt -path
sp.*.storage.lun.*.readsRate show -interval 10
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

Timestamp | SP | LUN | Read
 | | | Counts/s
-----+-----+-----+-----
2014-06-24 03:26:10 | spb | sv_1 | 0.225
2014-06-24 03:26:20 | spb | sv_1 | 0.200
 | | |
 | spb | sv_2 | 0.100
2014-06-24 03:26:30 | spb | sv_2 | 0.200
```

## Example 2

The following command displays the member values for the specified grouped real-time metric every 10 seconds in comma-separated values (CSV) format:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! uemcli /metrics/value/rt -path
sp.*.storage.lun.*.readsRate show -interval 10 -flat -output csv
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

Timestamp,spb sv_1 Read Counts/s
2014-06-24 03:26:10,0.225
Timestamp,spb sv_1 Read Counts/s,spb sv_2 Read Counts/s
2014-06-24 03:26:20,0.200,0.100
2014-06-24 03:26:30,,0.200
```

## Example 3

The following command displays the specified real-time metric every 10 seconds name-value pair (NVP) format:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! uemcli /metrics/value/rt -path
sp.*.storage.lun.*.readsRate show -interval 10 -output nvp
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

1: Timestamp = 2014-06-24 03:26:10
 SP = spb
 Client = sv_1
 CIFS Read = 0.225

2: Timestamp = 2014-06-24 03:26:20
 SP = spb
```



```
Client = sv_1
CIFS Read = 0.200

3: Timestamp = 2014-06-24 03:26:20
SP = spb
Client = sv_2
CIFS Read = 0.100

4: Timestamp = 2014-06-24 03:26:30
SP = spb
Client = sv_2
CIFS Read = 0.200
```

# Use Cases

This chapter contains the following topics:

## Topics:

- [Pool use cases](#)
- [File sharing use cases](#)
- [Resource configuration use cases](#)
- [Replication configuration use case](#)

## Pool use cases

This section describes different CLI use cases for pools.

### Create a pool using drives with specific characteristics

This example applies to hybrid Flash arrays, which only support traditional pools.

#### Retrieve the list of storage profiles

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

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

1: ID = profile_22
 Description = SAS RAID5
 Drive type = SAS
 RAID level = 5
 Maximum capacity = 4611148087296 (4.1T)
 Stripe length = Maximum capacity
 Disk group = dg_16
 Maximum drives to configure = 5
 Maximum capacity to configure = 1884243623936 (1.7T)

2: ID = profile_30
 Description = SAS RAID10 (1+1)
 Drive type = SAS
 RAID level = 10
 Maximum capacity = 9749818597376 (8.8T)
 Stripe length = 2
 Disk group = dg_13, dg_15
 Maximum drives to configure = 10, 10
 Maximum capacity to configure = 1247522127872 (1.1T), 2954304921600 (2.6T)

3: ID = profile_31
 Description = SAS RAID10 (2+2)
 Drive type = SAS
 RAID level = 10
 Maximum capacity = 9749818597376 (8.8T)
 Stripe length = 4
 Disk group = dg_13, dg_15
 Maximum drives to configure = 8, 8
 Maximum capacity to configure = 2363443937280 (2.1T), 952103075840 (886.7G)
```

## Configure a new pool

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /stor/config/pool create -name MyPool -description "My custom pool" -storProfile profile_22 -diskGroup dg_16 -drivesNumber 5
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection
```

```
ID = GP_4
Operation completed successfully.
```

## Configure a dynamic pool

You can configure dynamic pools for all-Flash models of Unity running OE version 4.2.x or later. New pools created for these models are dynamic pools by default. Dynamic pools implement advanced RAID technology. In dynamic pools, a RAID group is spread across drive extents in multiple drives. The required spare space is also spread across drive extents in multiple drives. When a drive fails, the extents on the failed drive are rebuilt to spare space extents within the pool.

When you configure dynamic pools, you can select different capacity drives from different drive groups with the same Flash drive types to create a tier. The total drive count of the drive type must be at least the stripe width plus one. For example, the total drive count for a RAID 4 + 1 group must be at least 6.

### Step 1: View the list of available drive groups

View the list of available drive groups, as shown in the following example:

```
[Request]
uemcli /stor/config/dg show
```

```
[Response]
Storage system address: 127.0.0.1
Storage system port: 443
HTTPS connection

1: ID = dg_2
 Drive type = SAS Flash 2
 FAST Cache = yes
 Drive size = 196971960832 (183.4G)
 Vendor size = 200.0G
 Rotational speed = 0 rpm
 Number of drives = 12
 Unconfigured drives = 12
 Capacity = 2363663529984 (2.1T)
 Recommended number of spares = 0

2: ID = dg_3
 Drive type = SAS Flash 2
 FAST Cache = yes
 Drive size = 393846128640 (366.7G)
 Vendor size = 400.0G
 Rotational speed = 0 rpm
 Number of drives = 12
 Unconfigured drives = 6
 Capacity = 4726153543680 (4.2T)
 Recommended number of spares = 0
```

## Step 2: View the list of storage profiles

View the list of storage profiles, as shown in the following example:

```
[Request]
uemcli /stor/config/profile show

[Response]
Storage system address: 127.0.0.1
Storage system port: 443
HTTPS connection

1: ID = profile_1
 Type = Dynamic
 Description = SAS Flash 2 RAID5 (4+1)
 Drive type = SAS Flash 2
 RAID level = 5
 Maximum capacity = 97373737844736 (88.5T)
 Stripe length = 5
 Disk group =
 Maximum drives to configure =
 Maximum capacity to configure =
```

## Step 3: Configure the dynamic pool

Configure the dynamic pool with the specified drive groups and profiles. Optionally set **-type** to **dynamic** and make sure that the **-drivesNumber** value for each drive type is not less than the drive group's RAID group width plus one:

```
uemcli /stor/config/pool create -name mypool -diskGroup dg_2,dg_3 -drivesNumber 4,2
-storProfile profile_1 -type dynamic
Storage system address: 127.0.0.1
Storage system port: 443
HTTPS connection

ID = pool_13
Operation completed successfully.[Request]
```

## Configure a traditional pool for an all-Flash model

You can configure traditional pools for all-Flash models of Unity running OE version 4.2.x by explicitly setting the `Type` attribute to `traditional`. If you do not set `Type` to `traditional` when you create a pool in the Unisphere CLI, a dynamic pool is created.

## Step 1: View the list of storage profiles

View the list of storage profiles, as shown in the following example:

```
[Request]
uemcli /stor/config/profile -traditional -configurable show

[Response]
Storage system address: 127.0.0.1
Storage system port: 443
HTTPS connection

1: ID = tprofile_2
 Type = Traditional
 Description = SAS Flash 2 RAID5 (8+1)
 Drive type = SAS Flash 2
 RAID level = 5
 Maximum capacity = 95010661072896 (86.4T)
 Stripe length = 9
```

```

Disk group = dg_34, dg_26
Maximum drives to configure = 9, 9
Maximum capacity to configure = 60189403250688 (54.7T), 2232208064512 (2.0T)

2: ID = tprofile_4
 Type = Traditional
 Description = SAS Flash 2 RAID5
 Drive type = SAS Flash 2
 RAID level = 5
 Maximum capacity = 95010661072896 (86.4T)
 Stripe length = Maximum capacity
 Disk group = dg_34, dg_26
 Maximum drives to configure = 9, 10
 Maximum capacity to configure = 60189403250688 (54.7T), 2691354329088 (2.4T)

```

## Step 2: Configure the traditional pool

Configure a traditional pool with the specified profile. Make sure you set `-type` to **traditional** and that the `-drivesNumber` is a multiple of the RAID group width.

```

uemcli /stor/config/pool create -name test -diskGroup dg_34 -drivesNumber 9
-storProfile tprofile_2 -type traditional

[Response]
Storage system address: 127.0.0.1
Storage system port: 443
HTTPS connection

ID = pool_6
Operation completed successfully.

```

## Add drives to an existing pool

### Retrieve the list of existing pools

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

```

Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

1: ID = SPL_1
 Name = Performance
 Description =
 Free space = 408944640 (390G)
 Capacity = 1099511627776 (1T)
 Drives = 6 x 250GB SAS
 Number of drives = 6
 Unused drives = 1
 RAID level = 5
 System pool = yes

2: ID = SPL_2
 Name = Capacity
 Description =
 Free space = 1319413953331 (1.2T)
 Capacity = 13194139533312 (12T)
 Drives = 8 x 2GB NL-SAS
 Number of drives = 8
 Unused drives = 0
 RAID level = 6
 System pool = yes

3: ID = SPL_3
 Name = Extreme Performance
 Description =

```

```
Free space = 209715200 (200M)
Capacity = 322122547200 (300G)
Drive type = EFD
Number of drives = 4
Unused drives = 0
RAID level = 5
System pool = yes
```

## Retrieve the list of recommended disk groups for the selected pool

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /stor/config/dg recom -pool SPL_3
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

1: ID = DG_4
 Drive type = EFD
 Drive size = 107374182400 (100G)
 Number of drives = 4
 Allowed numbers of drives = 4
 Capacity = 419430400 (400G)
```

## Extend the existing pool

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /stor/config/pool -id SPL_3 extend -
diskGroup DG_4 -drivesNumber 4
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

ID = SPL_3
Operation completed successfully.
```

# File sharing use cases

This section describes different use cases for NAS server file sharing.

## Create a NAS server with multiprotocol file sharing

### Create the NAS server

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /net/nas/server create -name MyFS1 -sp
spa -pool pool_0 -mpSharingEnabled yes -unixDirectoryService ldap -defaultUnixUser fred2
-defaultWindowsUser "fred2"
```

```
ID = nas_1
Operation completed successfully.
```

### View the NAS server details

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

```
1: ID = nas_1
 Name = MyFS1
 NetBIOS name =
 SP = spa
```

```

Storage pool = pool_0
Tenant =
Interface =
NFS enabled = yes
NFSv4 enabled = no
CIFS enabled = no
Workgroup =
Windows domain =
Organization unit =
Multiprotocol sharing enabled = yes
Unix directory service = ldap
Default Unix username = fred2
Default Windows username = fred2
Extended Unix credentials enabled = no
Credentials cache retention = 15
Health state = OK But (7)
Health details = "The component cannot
operate normally - additional configuration steps are
required. Please ensure configuration of Unix directory
service. Please ensure configuration of CIFS server."

```

## Configure LDAP and upload the Certificate Authority certificate

### Configure LDAP

```

uemcli /net/nas/ldap -server nas_1 set -ip 10.0.0.1,10.0.0.1 -port 636 -protocol ldaps
authType simple -bindDn "cn=administrator,cn=User,dc=emc,dc=com" - bindPasswd "Ldap123!" -
baseDn "dc=emc,dc=com"

```

Operation completed successfully.

### Upload the Certificate Authority certificate:

```

uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! -upload -f " MyCert.pem" /net/nas/ldap
-server nas_1 -type CACertificate

```

Operation completed successfully.

### View the LDAP configuration:

```

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

```

```

[Response]
1: NAS server = nas_1
 Servers = 10.0.0.1, 10.0.0.1
 Port = 636
 Protocol = ldaps
 Verify certificate = yes
 Authentication type = simple
 Bind DN = cn=administrator,cn=User,dc=emc,dc=com
 Use CIFS account =
 Principal =
 Realm =
 Base DN = dc=emc,dc=com
 Profile DN =

```

## Configure SMB for the NAS server

### Create the interface for the NAS server

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /net/nas/if create -server nas_1 -port
eth0_SPA -addr 10.0.0.1 -netmask 255.255.255.0
```

```
ID = if_0
Operation completed successfully
```

### Configure the NAS server as an SMB server

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /net/nas/cifs create -server nas_1 -
domain spb.sspg.lab.emc.com -username Administrator -passwd password1
```

```
ID = cifs_1
Operation completed successfully.
```

### View the NAS server health state

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

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

1: ID = nas_1
 Name = auto_mig_vdm_6380
 SP = spa
 Storage pool = pool_24
 Tenant =
 Interface = if_24
 CIFS enabled = yes
 Multiprotocol sharing enabled = no
 Unix directory service = none
 Default Unix username =
 Default Windows username =
 Username translation =
 Health state = OK (5)
 Health details = "The component is operating
normally. No action is required."
 Type = 64
 Migration Destination = yes
 Preferred production interfaces overridden =
 Preferred production IPv4 interface = auto
 Preferred production IPv6 interface = auto
 Preferred backup and DR test IPv4 interface = auto
 Preferred backup and DR test IPv6 interface = auto
 Source preferred production IPv4 interface =
 Source preferred production IPv6 interface =
```



## Share the file system between NFS and SMB

### Create the multiprotocol file system

```
/stor/prov/fs create -name MyFS -server nas_1 -pool pool_0 -size 1000M -type multiprotocol
-accessPolicy native
```

```
ID = res_1
Operation completed successfully.
```

### Create an NFS share for the multiprotocol file system

```
/stor/prov/fs/nfs create -name NFSshare -fs res_1 -path / -defAccess rw
```

```
ID = NFSShare_1
Operation completed successfully.
```

### Create an SMB share for the multiprotocol file system

```
/stor/prov/fs/cifs create -name CIFSshare -fs res_1 -path / -comment "cifsshare"
```

```
ID = SMBShare_1
Operation completed successfully
```

## Generate and review the user mapping report

### Generate the user mapping report

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /net/nas/server -id nas_1 update -
userMapping -dryRun
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

Operation completed successfully.
```

### Retrieve the user mapping report

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! uemcli -download /net/nas/server -id
nas_1 -type mappingReport
```

```
Operation completed successfully.

>ls mappingReport_2014-11-18_18-08-00.txt
```

## Resource configuration use cases

This section describes use cases for configuring different storage resources.

## Identify pool capacity and configure a resource

Identify the SP where the server to be used is located by default

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /net/nas/server -id nas_1 show
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection
```

```
1: ID = nas_1
 Name = MySFS1
 CIFS enabled = yes
 NFS enabled = no
 SP = spa
 Interface = if_1
```

Check the maximum capacity of the appropriate pool on the identified SP

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

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection
```

```
1: ID = pool_1
 Name = TestPool
 Description =
 Total space = 6266625720320 (5.6T)
 Current allocation = 2684354560 (2.5G)
 Remaining space = 6263941365760 (5.6T)
 Subscription = 111967084544 (104.2G)
 Subscription percent = 1%
 Alert threshold = 70%
 Drives = 4 x 3.1T SAS Flash 3
 Number of drives = 4
 RAID level = 10
 Stripe length = 2
 Rebalancing = no
 Rebalancing progress =
 Health state = OK (5)
 Health details = "The component is operating
normally. No action is required."
 FAST Cache enabled = no
 Protection size used = 32768 (32.0K)
 Auto-delete state = Idle
 Auto-delete paused = no
 Auto-delete pool full threshold enabled = yes
 Auto-delete pool full high water mark = 95%
 Auto-delete pool full low water mark = 85%
 Auto-delete snapshot space used threshold enabled = no
 Auto-delete snapshot space used high water mark = 25%
 Auto-delete snapshot space used low water mark = 20%

2: ID = pool_2
 Name = Test1
 Description =
 Total space = 43403328880640 (39.4T)
 Current allocation = 57982058496 (54.0G)
 Remaining space = 43345346822144 (39.4T)
 Subscription = 1627792605184 (1.4T)
 Subscription percent = 3%
 Alert threshold = 70%
 Drives = 15 x 600.0G SAS;
 2 x 200.0G SAS Flash 2;
 8 x 6.0T NL-SAS;
```

```

Number of drives = 2 x 800.0G SAS Flash 2
RAID level = 27
Stripe length = Mixed
Rebalancing = Mixed
Rebalancing progress = no
Health state =
Health details = OK (5)
 = "The component is operating
normally. No action is required."
FAST Cache enabled = yes
Protection size used = 2147483648 (2.0G)
Auto-delete state = Idle
Auto-delete paused = no
Auto-delete pool full threshold enabled = no
Auto-delete pool full high water mark = 95%
Auto-delete pool full low water mark = 85%
Auto-delete snapshot space used threshold enabled = no
Auto-delete snapshot space used high water mark = 25%
Auto-delete snapshot space used low water mark = 20%

```

## Configure a resource

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /stor/prov/fs create -name FileSystem01
-descr "NFS shares" -pool capacity -server nas_1 -size 1TB -type nfs
```

```

Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

```

```

ID = res_1
Operation completed successfully.

```

# Replication configuration use case


This section describes the use cases for configuring replication for block or file storage resources.

## Before you begin

Before you proceed with configuring replication, ensure that you complete the following:

- Create identical storage resources on the source and destination systems.
- Configure replication interfaces for each SP on the source and destination systems.
- On the destination system, the relevant storage resources and NAS servers are individually created with the `-replDest` attribute set to `yes`.
- For file replication, ensure the following:
  - Start with creating identical NAS servers on both the systems, and then create identical file systems.
  - Configure the NAS server on the destination system with a name other than the NAS server name on the source system.
  - Configure file systems on the destination system with the same name as the file systems on the source system.

## Configure local replication

 **NOTE:** Local replication is applicable to asynchronous replication only. Local replication is not applicable to synchronous replication.

Replication interfaces and connections do not apply to local replication. When using the CLI or the REST API, once you create the identical source and destination storage resources or NAS servers on the storage system, you can proceed to configure a replication session. When using Unisphere, you only need to create the source storage resources or NAS servers on the storage system. Unisphere does not allow you to create a session with an existing destination. A `DR_` is concatenated onto the resource name for local destinations to ensure that the source and destination names on the same system are unique (that is, LUN names need to be unique).

Note the following:

- For a disaster recovery scenario, it is recommended that the destination storage resource and NAS server are configured on a storage pool other than the pool used for the source storage resource and NAS server.
- For a migration scenario, which means migrating the source storage resource and NAS server to a destination storage resource and NAS server on the same pool, use the CLI to configure local replication. The Unisphere GUI does not allow local replication between storage resources and NAS servers on the same pool.

## Configure asynchronous replication


### Prerequisites


If you are configuring asynchronous replication for a tenant, create a pool for the tenant on the destination system that matches the corresponding pool on the source system (if one exists). Then add the tenant to the destination system, using the same UUID and VLANs as the tenant on the source.

If you are configuring asynchronous replication in a coexisting synchronous and asynchronous replication topology, create the asynchronous replication destination NAS server with both the `-replDest` and the `-backupOnly` attributes set to **yes**. These attributes must be set to **yes** on the asynchronous replication destination NAS server when the source NAS server is synchronous replicated; otherwise, the asynchronous replication session cannot be created.

### Steps


1. Configure the replication interfaces on each SP of the source and destination systems.
2. Configure a replication connection using the **Asynchronous** connection mode.
3. For file storage, create a replication session for the NAS server associated with the file storage.

 **NOTE:** Storage resources included in a NAS server automatically get replicated when a replication session is first configured for the NAS server. The replication session for the storage resources will inherit the same attributes as the associated replication session of the associated NAS server. For the storage resources you do not want participating in replication, you can choose to remove the associated replication sessions manually.
4. Create a remote replication session for the storage resource.

 **NOTE:** You only need to configure replication interfaces and connections for the first replication session between two systems. The same connection can be used again for subsequent replication sessions between the same systems.

## Configure synchronous replication

### About this task

 **NOTE:** Only remote replication is supported for synchronous replication.

### Steps

1. Identify the Synchronous Replication Fibre Channel (FC) ports on each system.


To determine the FC port used for synchronous replication, in the CLI console, run the command `/remote/sys show -detail`. Port information, similar to the following example, will appear in the output:

```
Synchronous FC ports = spb_fc4, spa_fc4
```

For more information, see the *Unisphere CLI User Guide*.
2. Zone the Synchronous Replication FC ports between the systems.

If the source and destination systems are co-located, instead of zoning, you can choose to use direct-connected FC cables between the SPs.
3. Configure the replication interfaces on each SP of the source and destination systems based on the connection mode you want:
  - For synchronous replication support (**Synchronous** connection mode), use the Synchronous Replication Management Ports on each SP of both the systems.

- For asynchronous and synchronous replication support (**Both** connection mode), in addition to the replication interfaces for Synchronous Replication Management Ports, configure additional interfaces using the Ethernet Ports on each SP of the source and destination systems.
4. Configure the replication connection between source and destination systems from the source system only.
    - For synchronous replication support, specify the **Synchronous** connection mode.
    - For asynchronous and synchronous replication support, specify the **Both** connection mode.
  5. Create the synchronous replication session.

 **NOTE:** You only need to configure replication interfaces and connections for the first replication session between two systems. The same connection can be used again for subsequent replication sessions between the same systems.

## Create a replication interface

### Prerequisites

Protection and mobility (import) interfaces can be shared between replication and import. For import, only VDM imports require interfaces. Block imports do not require interfaces.


Protection and mobility (import) interfaces are configured to support VDM imports and must be created prior to creating an import connection. A mobility interface IP address is assigned to SPA and SPB on the target Unity system. Once the mobility interface is configured, you can create the import connection between the Unity system and the VNX system. Mobility interfaces are not used for block import sessions.

Ensure the following:

- The interface port is cabled and connected to a network switch.
- Both SPs are up and running.

Obtain the following information for each Storage Processor (SP):

- IP address associated with the interface (replication or import). Although you can specify an IPv4 or IPv6-based address, ensure that you specify the same type of address for both SPs.
- IP address mask or prefix length that identifies the associated subnet.
- Gateway IP address associated with the interface.
- If applicable, the VLAN ID (between 1 and 4095) you want to associate the interface with.

 **NOTE:** For the network to continue functioning properly, ensure that you set the VLAN ID only when you have configured the network switch port to support VLAN tagging of multiple VLAN IDs.

### About this task

Ensure that you create replication interfaces on each SP.

### Steps

1. Run the following command to create the interface on SP A:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /net/if create -type replication -port eth1_spa -addr 10.0.1.1 -netmask 255.255.255.0 -gateway 10.0.1.0
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

ID = IF_1
Operation completed successfully.
```

2. Run the following command to create the interface on SP B:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /net/if create -type replication -port eth1_spb -addr 10.0.1.2 -netmask 255.255.255.0 -gateway 10.0.1.0
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection
```

```
ID = IF_2
Operation completed successfully.
```

## View interfaces

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

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

1: ID = IF_0
 Type = iscsi
 Port = eth0_spa
 VLAN ID = 0
 IP address = 3ffe:80c0:22c:4e:a:0:2:7f/64
 Subnet mask =
 Gateway =
 SP = fe80::20a8bfff:fe5a:967c
 SP = spa

2: ID = IF_1
 Type = replication
 Port = eth1_spa
 VLAN ID = 1
 IP address = 10.0.1.1
 Subnet mask = 255.255.255.0
 Gateway = 10.0.1.0
 SP = spa

3: ID = IF_2
 Type = replication
 Port = eth1_spb
 VLAN ID =
 IP address = 10.0.1.2
 Subnet mask = 255.255.248.0
 Gateway = 10.0.1.0
 SP = spb
```

## Create a replication connection

### Prerequisites

Ensure that you have set up relevant replication interface pairs, one on each SP, on the source and destination systems. Obtain the following information:

- For remote replication, the IP address and associated user authentication credentials to connect to the remote system.
- For local replication, the password associated with your user account.
- The connection mode you want to use for the replication: Asynchronous, Synchronous, or Both.

**i NOTE:** If a replication connection already exists and you plan to add a different mode of file replication, do not attempt to create a new connection. Change the existing replication connection mode to Both. Also, ensure that you have the appropriate interface types configured to support both asynchronous replication (eth2, eth3) and synchronous replication (sync replication mgmt port).

### About this task

Consider that you want to create an asynchronous replication connection to the remote system with the IP address 10.1.1.1.

### Steps

- Run the following command:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /remote/sys create -addr
10.1.1.1 -srcUsername admin1 -srcPassword Password456! -dstUsername admin2 -dstPassword
Password986! -connectionType async
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection
```

```
ID = RS_1
Operation completed successfully.
```

## View settings for remote storage systems

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

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection
```

```
1: ID = RS_1
 Name = MyTargetSystem
 Address = 10.1.1.1
 Model = Unity 300
 Serial number = FCNCH01234567A90
 Connection type = async
 Source interfaces = N/A
 Local interfaces = N/A
 Remote interfaces = N/A
 Operational status = OK (0x2)
 Health state = OK (5)
 Health details = "Communication with the replication
 host is established. No action is
 required."
 Synchronous FC ports = spb_fc4, spa_fc4
```

## Create a replication session for block storage

### Prerequisites

Complete the following:

- For remote replication:
  - Identify the remote system that will act as the replication destination.
  - Create relevant replication interfaces, replication connection, and a storage resource on the remote system that will act as the destination.
- For local replication, create a storage resource that will act as the destination.
- Determine the replication synchronization mode you want. You can specify asynchronous (async), synchronous (sync), or manual synchronization (manual).
- For asynchronous replication, determine the Recovery Point Objective (RPO) for the replication session.

### Steps

- Run the following command to create a synchronous replication session between the LUN "LUN\_1" on the source system and the LUN "LUN\_2" located on the remote system "RS\_2":

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /prot/rep/session create -name REP1
-srcRes LUN_1 -dstType remote -dstSys RS_2 -dstRes LUN_2 -syncType auto -rpo 0
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection
```

```
ID = 81604378625_FCNCH097274B3A_0000_81604378627_FCNCH097274B37_0000
Operation completed successfully.
```

## Create an asynchronous replication session for file storage

### Prerequisites

Complete the following:

- For remote replication:
  - Identify the remote system that will act as the replication destination.
  - Create relevant replication interfaces, replication connection, and a storage resource on the remote system that will act as the destination. The storage resource on the destination system must have the same size
- For local replication, create a storage resource that will act as the destination.
- For file replication, create a replication session on the NAS server associated with the file storage.
- For asynchronous replication, determine the Recovery Point Objective (RPO) for the replication session.

**i NOTE:** If you are configuring asynchronous replication in a coexisting synchronous and asynchronous replication with one source resource topology, create the asynchronous replication destination NAS server with both the `-replDest` and the `-backupOnly` attributes set to **yes**. These attributes must be set to **yes** on the asynchronous replication destination NAS server when the source NAS server is synchronous replicated; otherwise, the asynchronous replication session cannot be created.

### About this task

Configure an asynchronous replication session between the NAS servers associated with the file storage, with an RPO set to 2 hours 30 minutes and automatic synchronization. On the source system, the file system "res\_7" is associated with NAS server "nas\_1". And, the file system "res\_8" is associated with NAS server "nas\_2" on the remote system.

### Steps

1. Run the following command to create an asynchronous replication session between the NAS servers:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /prot/rep/session create -async -srcRes
nas_1 -dstType remote -dstSys RS_2 -dstRes nas_2 auto -rpo 02h30m
```

```
Job ID = N-86
Operation completed successfully.
```

2. Run the following command to create an asynchronous replication session between the file system "res\_7" on the source system and the file system "res\_8" located on the remote system "RS\_2", with an RPO set to 2 hours 30 minutes and automatic synchronization:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /prot/rep/session create -async -srcRes
res_7 -dstType remote -dstSys RS_2 -dstRes res_8 -syncType auto -rpo 02h30m
```

```
Job ID = N-89
Operation completed successfully.
```

## Create a synchronous replication session for file storage

### Prerequisites

Complete the following:

- For remote replication:
  - Identify the remote system that will act as the replication destination.
  - Create relevant replication interfaces, replication connection, and a storage resource on the remote system that will act as the destination. The storage resource on the destination system must have the same size.
- For local replication, create a storage resource that will act as the destination.
- For file replication, create a replication session on the NAS server associated with the file storage.



## About this task

Configure a synchronous replication session between the NAS servers associated with the file storage.

## Steps

1. Run the following command to create a synchronous replication session between the NAS servers:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /prot/rep/session create -name MyNSRep1 -srcRes nas_1 -dstType remote -dstSys RS_1 -dstRes nas_1
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

ID = 103079215106_FCNCH097274999_0000_103079215106_FCNCH0972749A9_0000
Operation completed successfully.
```

2. Run the following command to create a synchronous replication session between file systems on the source system and the remote system:

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /prot/rep/session create -name MyFSRep1 -srcRes res_1 -dstType remote -dstSys RS_1 -dstRes res_1
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

ID = 171798691844_FCNCH097274999_0000_171798691844_FCNCH0972749A9_0000
Operation completed successfully.
```

## View replication sessions

```
uemcli -d 10.0.0.1 -u Local/joe -p MyPassword456! /prot/rep/session show
```

```
Storage system address: 10.0.0.1
Storage system port: 443
HTTPS connection

1: ID =
81604378635_FCNCH097274B3A_0000_81604378637_FCNCH097274B37_0000
 Name = REP2
 Session type = nas server
 Synchronization type = auto
 Resource type = NAS Server
 Destination type = remote
```

# Reference

This appendix contains the following topics:

**Topics:**

- [Health details](#)

## Health details

Health details attribute contains a user-friendly description of the health status of the component. When applicable, it also includes a URL to the online help or support page that provides steps to resolve a problem. A component may have multiple description strings indicating the health of the relevant subcomponents. For example:

```
Health details = "The storage resource has failed because it uses a storage pool
that includes one or more disks with problems. Remedy the problem with the disks.
(http://10.0.0.1/alerts/context_sensitive/dpe_invalid_disk.htm)", "An I/O module in your
disk-processor enclosure (DPE) may have faulted. Reboot the storage processor (SP). If
the problem persists after the reboot, replace the I/O module. (http://10.0.0.1/alerts/
context_sensitive/replace_failed_part.htm) "
```