EMC® VNX™

Release 1.1

Command Line Interface (CLI) Reference for Block

P/N 300-011-815

REV A02

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Published September 2011

Corporate Headquarters: Hopkinton, MA 01748-9103

Contents

Preface

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

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

Audience

This guide is part of the EMC Unisphere documentation set, and is intended for use by those who will use CLI commands to configure, manage, or obtain the status of EMC systems.

This version of the manual covers up to VNX systems running release 1.1.25 of Unisphere.

Readers of this guide are expected to be familiar with the following topics:

- The operating system running on the servers you will manage.
- system components and configurations.

For introductory information, refer to the appropriate configuration planning guide for your system.

Organization

This manual contains thirteen chapters and three appendixes as follows:

Chapter 1 - About CLI Commands	Introduces the EMC Navisphere CLI commands.
Chapter 2 - Navisphere CLI	Introduces the EMC Navisphere system management configurations and architecture.

Chapter 3 - Virtual Pools Commands	Provides a brief overview of the Virtual Pools feature and describes the storage pool and thin commands that you can use if this feature is enabled on your system.
Chapter 4 - Auto-tiering Commands	Provides a brief overview on the auto-tiering feature and includes a list of commands that you can use if the feature is enabled on your system.
Chapter 5 - Compression Commands	Provides a brief overview of the compression feature and includes a list of compression commands that you can use if this feature is enabled on your system.
Chapter 6 - FAST Cache Commands	Provides a brief overview of the EMC FAST Cache feature and includes a list of FAST Cache commands that you can use, if the feature is enabled on your system.
Chapter 7 - EMC Unisphere QoS Manager	Introduces the EMC Unisphere Quality of the Service (QoS) Manager application, associated dependencies, and the online help system.
Chapter 8 - EMC Unisphere Analyzer	Introduces the EMC Unisphere Analyzer performance monitor application, which measures the performance of systems.
Chapter 9 - EMC VNX MirrorView/A CLI	Introduces the EMC VNX MirrorView/Asynchronous software and the EMC Navisphere system management configurations and architecture.
Chapter 10 - EMC VNX MirrorView/S CLI	Introduces the EMC VNX MirrorView/Synchronous software and the EMC Navisphere system management configurations and architecture.
Chapter 11 - SAN Copy and its Command Line Utilities	Introduces the EMC SAN Copy software and its command line utilities: admhost, with commands that the operating system uses to manage SAN Copy devices; and the CLI, with commands that manage SAN Copy sessions.
Chapter 12 - EMC SnapView Software	Introduces the EMC SnapView software and its user interface, as well as the two command line interfaces for it. The command line interfaces include the server-based admsnap utility and the EMC Navisphere CLI interface.
Chapter 13 - Using Online Help	Explains how to access the online help from the application's main window.

Appendix A - CLI Error Codes	Lists the error codes of CLI commands such as Secure CLI commands, Storage group commands, SnapView, MirrorView, and feature commands.
Appendix B - Secure CLI Command Coverage	Provides a list of commands that are supported by Secure CLI on various systems.
Appendix C - Role support for CLI commands	Lists the roles supported for various CLI commands.

Special notice conventions

EMC uses the following conventions for special notices:

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

Important: An important note contains information essential to operation of the software.

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

Hint: A note that provides suggested advice to users, often involving follow-on activity for a particular action.

Systems no longer covered in this document

The table below lists the systems that are no longer covered in this document and the last revision of this document that included the systems.

System removed	Last revision including the system
CX200, CX400, and CX600	300-003-628 Rev. A07 069001184 Rev. A11 300-001-335 Rev. A11 300-004-210 Rev. A02 069001181 Rev. A14
FC series; C series	069001038 Rev. A14 300-001-335 Rev. A11 069001184 Rev. A11
FC4700	069001184 Rev. A08

Related documentation

Related documentation for EMC Navisphere CLI reference includes:

For CX4 series, CX3 series, and CX series systems, refer to the latest version of the EMC Navisphere Command Line Interface (CLI) Reference (P/N 300-003-628), EMC SAN Copy Command Line Interfaces Reference (P/N 069001189), EMC SnapView Command Line Interfaces (CLI) Reference (P/N 069001181), EMC MirrorView/Asynchronous Command

Line Interface (CLI) Reference (P/N 300-001-335), and EMC MirrorView/Synchronous Command Line Interface (CLI) Reference (P/N 069001184).

For the most current management and security content for CX4 series, CX3 series, and CX series systems, refer to the EMC Unisphere online help.

Related documentation for Quality of Service Manager reference includes:

For the most current management, security, replication, and performance information for CX4 series, CX3 series and CX series systems, refer to the Unisphere help and the latest version of the EMC Navisphere Command Line Interface (CLI) Reference. Unisphere help is available in the Unisphere UI and in the Technical Documentation and Advisories section of the Powerlink website (http://Powerlink.EMC.com).

Related documentation for EMC Unisphere Analyzer Command Line Interface reference includes:

For additional AX4-5 series, CX4™ series, CX3™ series, and CX™ series systems, refer to the appropriate version of the EMC Unisphere online help and the EMC Navisphere Command Line Interface (CLI) Reference for your software revision.

Related documentation for EMC Unisphere MirrorView Asynchronous/Synchronous Command Line Interface reference includes:

For AX4-5 series, CX4™ series, CX3™ series, and CX™ series systems, refer to the appropriate version of the EMC Navisphere Command Line Interface (CLI) Reference for your software revision.

For the most current management and security content for AX4-5 series, CX4 series, CX3 series, and CX series systems, refer to the Unisphere help, which is available from the Unisphere UI and from the Support tab on the Powerlink website (http://Powerlink.EMC.com).

We recommend that you download the latest information before you run the CLI commands.

- EMC Unisphere Host Agent and CLI Release Notes
- EMC MirrorView/Synchronous Release Notes
- EMC MirrorView/Asynchronous Release Notes
- The version of this manual that is applicable to your software revision

Related documentation for EMC Unisphere SAN Copy Command Line Interface reference includes:

CX4 series systems

For information on attaching a server, refer to the CLARiiON CX4 support website. To access the website, go to http://www.emc.com/clariionsupport and select the CX4 series system.

CX3 series systems

Refer to the CLARiiON server support products installation guides on the Powerlink website.

AX4-5 series or AX series systems

For information on planning SAN Copy or SnapView configurations for your system, select Install > Plan on the AX4-5 or AX150 support website.

The most up-to-date information about the EMC SAN Copy software is posted on the EMC Powerlink website. We recommend that you download the latest information before you start the SAN Copy software. If you purchased this product from an EMC reseller and you cannot access Powerlink, the latest product information should be available from your reseller.

To access EMC Powerlink, use the following link:

http://Powerlink.EMC.com

After you log in, select Support and find the following:

- EMC Admhost Release Notes
- EMC SAN Copy Release Notes
- The latest version of this guide that is applicable to your software revision

Related documentation for EMC Unisphere SnapVIew Command Line Interface reference includes:

CX4 series systems

For information on attaching a server, refer to the CLARiiON CX4 support website. To access the website, go to http://www.emc.com/clariionsupport and select the CX4 series system.

CX3 series systems

Refer to the CLARiiON server support products installation guides on the Powerlink website.

AX4-5 series or AX series systems

For information on planning SAN Copy or SnapView configurations for your system, select Install > Plan on the AX4-5 or AX150 support website.

- EMC CX4-5 Series, CX3 Series, or CX Series Storage System Configuration Planning Guide
- CLARiiON CX4-5 Series, CX3 Series, or CX Series Software Installation Guide
- EMC CLARiiON Server Support Products for AIX Installation Guide
- EMC CLARiiON Server Support Products for HP-UX Installation Guide
- EMC CLARiiON Server Support Products for Linux Server Installation Guide
- EMC CLARiiON Server Support Products for VMware ESX Server Installation Guide
- EMC CLARiiON Server Support Products for NetWare Installation Guide
- EMC CLARiiON Server Support Products for Solaris Installation Guide
- EMC CLARiiON Server Support Products for Windows Installation Guide

For the most current management and security content for CX4 series, CX3 series, or CX series and supported AX4-5 series or AX series systems, refer to EMC Unisphere™ online help. For FC series and C series management and security content, refer to the most recent versions of EMC Navisphere Manager Administrator's Guide and EMC Navisphere Security Domains, Multi-Domains and User Accounts Administrator's Guide.

For the most current information on CX4 series, CX3 series, CX series, AX4-5 series, and AX series systems, refer to the latest version of the EMC Navisphere Command Line Interface (CLI) Reference. For the most current information on FC series and C series systems, refer to the most recent version of the EMC Navisphere Command Line Interface (CLI) Reference.

Typographical conventions

EMC uses the following type style conventions in this document.

Type style	Used for
Normal	◆ Running text ◆ Names of resources, attributes, pools, clauses, functions, and utilities
Italic	◆ Titles of publications (citations) ◆ Variables, in running text
Courier italic	Variables, in syntax diagrams and user input (except Celerra)
Courier bold	Command names, options, and keywords
Helvetica bold	◆ User interface elements (what users specifically select, click, or press) ◆ Names of interface elements (such as names of windows, dialog boxes, buttons, fields, and menus)
Courier	URLs, email addresses, pathnames, filenames, directory names, computer names, links, groups service keys, file systems, command names (in running text), user input (such as commands), and notifications (system output, system messages, etc.)
[ ]	Optional selections
{}	Required selections
|	Alternative selections. The bar means “or”
...	Nonessential information omitted from an example

Where to get help

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

Product information — For documentation, release notes, software updates, or for information about EMC products, licensing, and service, go to the EMC Powerlink website (registration required) at http://Powerlink.EMC.com.

Technical support — For technical support, go to Powerlink and choose **Support**. On the Support page, you will see several options, including one for making a service request. Note that to open a service request, you must have a valid support agreement. Please contact your EMC sales representative for details about obtaining a valid support agreement or with questions about your account.

Your comments

Your suggestions will help us continue to improve the accuracy, organization, and overall quality of the user publications.

Please send your opinion of this document to:

techpubcomments@EMC.com

1

About CLI Commands

This chapter explains the EMC Navisphere Secure CLI commands.

Note: If you currently use Classic or Java CLI to issue CLI commands, note that Secure CLI has replaced both Classic and Java CLI. Neither Classic or Java CLI are supported on EMC ®VNX™ series systems. For information on support for Classic and/or Java CLI on earlier platforms, refer to the earlier versions of the appropriate revision of the Navisphere CLI Reference.

Major topics include:

About Secure CLI

Secure CLI is a comprehensive Navisphere CLI solution that provides one application and one security model for all CLI commands. Secure CLI provides role-based authentication, audit trails of CLI events, and SSL-based data encryption. You do not need to install a JRE to run Secure CLI.

Note: Refer to the *Host Agent/CLI and Utilities Release Notes*, available on Powerlink, for a list of supported operating systems. You must be running FLARE® Operating Environment version 02.19.xxx.5.yyy or later.

Secure CLI commands run in a command window. Each command consists of the **`naviseccli`** command (and options) together with another subcommand (and its options).

Note: Secure CLI does not distinguish case of characters, so, regardless of the host operating system, you can use either uppercase, lowercase, or any combination of characters as you type commands.

If a Secure CLI command fails and the CLI does not generate its own error message, it displays an error message from the SP agent. Secure CLI generates errors about command line syntax for commands and options and their values.

Secure CLI commands return 0 if the command is successful, or a number greater than zero if the command is unsuccessful.

Getting started with Secure CLI

Before you begin to issue Secure CLI commands, you must create a user account on the system. To create the required user accounts using Navisphere CLI, refer to the *EMC Navisphere Command Line Interface (CLI) Reference*. For details on using Secure CLI, refer to the Unisphere online help.

You can also choose to configure Secure CLI to issue Secure CLI commands on the host (see Using Secure CLI on page 33). If you establish a security file, you do not need to include the switches **-user**, **-scope**, and **-password** (or the password prompt) in each command you issue.

Using Secure CLI

A system will not accept a command from Secure CLI unless the user who issues the command has a valid user account on the system. You can specify a valid account username, password, and scope (global, local, or lightweight directory access protocol (LDAP)) for each command you issue, or, more conveniently, you can create a Unisphere security file.

The Unisphere security file is an encrypted file stored for each user on each host. You can add or delete a user security file using the **-AddUserSecurity** or **-RemoveUserSecurity** functions as arguments to the **naviseccli** command. You cannot copy a security file to another host. You must issue the **-AddUserSecurity** function on the host for which you want to create the security file.

When you create a security file, the username you use to log in to the current host is automatically stored in the security file, or you can specify an alternative username for the security file in the **-AddUserSecurity** request using the optional **-user** switch. If you omit the **-user** switch, the security file uses your current username. You can also target the security file at a specific system using the **-ip** option.

For example, to add yourself to the security file on the current host, given the alternative username `altusername`, the password `mypass` and the scope `0` (global scope), type:

```
naviseccli -address SP-IP -AddUserSecurity -password mypass -scope 0 -user
 altusername
```

Then, on this host, you can enter CLI commands to any system on which you have an account that matches the username `altusername`, with password `mypass` and global scope (scope 0).

You can also construct a security file with a default credential and security credentials for a specific system. Multiple security credentials can be added to a security file by specifying either an SP hostname or IP address when adding the credential. But only one credential can exist for a particular SP. The addition of a new default credential will cause the old one to be overwritten.

Note: Username and password are case sensitive.

The security file is stored in your default home directory. With Secure CLI, you can specify an alternative file path using the optional **-secfilepath** switch.

Note: If you specify an alternative location for the security file, you must specify the file path in every subsequent CLI command you issue to ensure the CLI locates the security file.

To save the example used above to the alternative location `c:\altlocation\` type:

```
naviseccli -AddUserSecurity -password mypass -scope 0 -user altusername
-secfilepath c:\altlocation\
```

Then, for each subsequent command you issue, you must specify the **-secfilepath** switch with the security file path location `c:\altlocation\` in the command line.

naviseccli

Sends status or configuration requests to a system through the command line.

PREREQUISITES

Anyone that can log in to the server running Navisphere CLI 6.X or later.

DESCRIPTION

The **naviseccli** command sends system management and configuration requests to a system through the Internet.

SYNTAX

```
naviseccli -help

naviseccli [-address IPAddress | NetworkName | -h IPAddress | NetworkName]
[-AddUserSecurity]
[-f filename]
[-m]
[-nopoll | -np]
[-parse | -p]
[-password password]
[-port port]
[-q]
[-RemoveUserSecurity]
[-scope 0|1|2]
[-secfilepath]
[security -certificate]
[-timeout | -t timeout]
[-user username]
[-v]
[-xml]
CMD[optional-command-switches]
```

OPTIONS

-help

Displays the help screen and does not start the **naviseccli** process. To start the **naviseccli** process, use one or more of the switches that follows instead.

-address *IPAddress*|*NetworkName*|**-h** *IPAddress*|*NetworkName*

Specifies the IP address or network name of the targeted SP on the desired system. The default, if you omit this switch, is **localhost**.

-AddUserSecurity

Directs the CLI to add user security information to the security file on this server. You must use the **-scope** switch to add scope information to the security file. You can use the **-password** switch or enter your password into the password prompt (see **-password**), to supply the required password information to the security file. The **-user** and **-secfilepath** switches are optional with this command.

Note: If you specify the **-user** switch, you can create an alternative username to your server login name in the security file you create on this server. If you use the **-secfilepath** switch, you can specify an alternative location to your default home directory, for the security file on this server. You must then use the **-secfilepath** switch in each subsequent command you issue.

-f *filename*

Stores the data in a file.

-m

Suppresses output except for values. This option is most useful when used as part of a script.

-nopoll|-np

Directs the feature provider not to issue a poll request. This switch significantly increases performance when dealing with large or multiple systems. The feature provider is automatically issues a poll request unless this switch is specified.

Note: When the **-nopoll** switch is set, **get** commands may return stale data and **set** commands may erase previously changed settings. Use caution when the **-nopoll** switch is set.

-parse |-p

Directs the CLI to validate the command. The CLI verifies the command syntax and displays a message stating whether the command was valid. The CLI takes no other action.

-password *password*

Specifies the password on the system you want to log in to. The password is visible in the command line. Passwords are case-sensitive. If you want to mask the password, and you are not using a security file, you can omit this switch from the command line. The CLI then prompts you to enter a password. The information you enter into the password prompt is concealed.

Note: You can omit this switch if you are using a security file. See **-AddUserSecurity**.

-port *portnumber*

Sets the port number (type) of the system. The default is 443. If you choose to change the default port number, management port 2163 will be supported; however, you will need to specify the **-port** switch and number 2163 in every subsequent command you issue.

-q

Suppresses error messages. This switch is useful when included as part of a script.

-RemoveUserSecurity

Directs the CLI to remove user security information about the current user from the security file on this server.

-scope 0|1|2

Specifies whether the user account on the system you want to log in to is local, global, or lightweight directory access protocol (LDAP). A 0 (default) indicates global, 1 indicates local, and 2 indicates LDAP. A global account is effective throughout the domain. When the administrator creates a global account, the software copies the definition of this account to the domain directory, which makes it accessible on all systems in the domain. A local account is effective only on the systems for which the administrator creates the account. You can log in only to those systems on which you have a local account. LDAP maps the username/password entries to an external LDAP or active directory server for authentication. Username/password pairs whose roles are not mapped to the external directory will be denied access.

-secfilepath *filename*

Stores the security file in a file path location you specify. When you create a security file on a server using the **-addusersecurity** command, the security file is saved to your default home directory. If you want to store the security file in an alternative location, you can use the optional **- secfilepath** switch with the **-addusersecurity** command.

Note: If you use the **-secfilepath** switch to set up an alternative path for your security file, you must use this switch in every subsequent CLI command you issue, to ensure the CLI locates the security file.

---

security -certificate

Saves the certificates to the certificate store. It also provides options like **-list**, **-remove**, **-add** to manage the certificate store.

-timeout |-t *timeout*

Sets the timeout value in seconds. The default is 600 seconds.

-user *username*

Specifies the username on the system you want to log in to. Usernames are case sensitive. You can omit this if you have added the username to the security file.

Note: You can use this switch when establishing a security file, to specify an alternative username. See **-AddUserSecurity**.

-v

Enables verbose error descriptions. This is the default unless **-q** is specified.

-xml

Specifies command output in XML format. Use the **-o** (override switch) when specifying **-xml** with commands that require confirmation. Otherwise, the XML output will contain your confirmation string.

CMD

One of a set of commands used with the **naviseccli** command. The CMD switches are described on the pages that follow.

LUN IDs, unique IDs, and disk IDs

In Unisphere, the term *LUN ID* or *LUN number* means the unique integer assigned to the LUN when it is bound. When you create a LUN, you can select the ID number. If you do not specify one, the default for the first LUN bound is 0, the second 1, the third 2, and so on. The maximum number of LUNs supported (and thus the valid range of LUN IDs) depends on the system and operating system. See the EMC Support Matrix on the Powerlink website for the number of LUNs supported with your configuration.

The term unique ID applies to systems, SPs, HBAs, and switch ports. It means the World Wide Name (WWN) or World Wide Port Name (WWPN), which is a number designed to be unique in the world.

The systems have 16-byte unique IDs; SPs, HBAs, LUNs, and switch ports have 32-byte unique IDs. In systems that use storage groups, the Storage Group (Access Logix™) software assigns the unique IDs. Generally, unique IDs are transparent to users, but sometimes you need to specify them in commands. You can discover the unique IDs by entering the appropriate CLI list or get list command for the operation you want to perform.

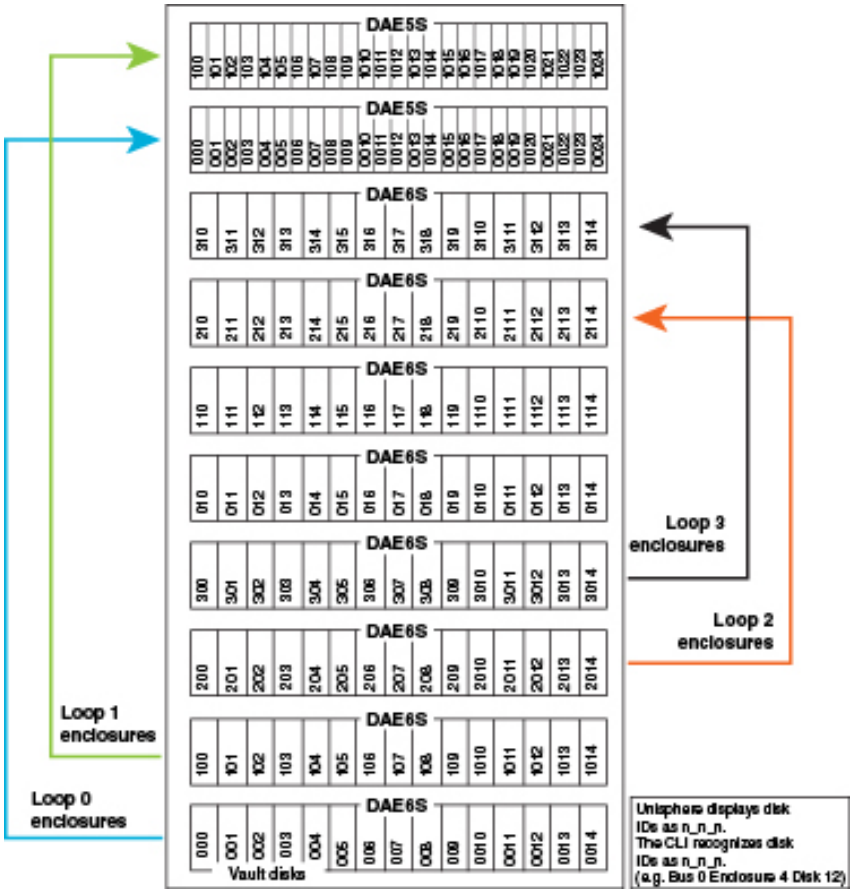
Disk IDs depend on the kind of system and type of enclosure. The systems can have multiple back-end buses, and thus need a bus designator before the enclosure and disk designator:

`bus-number enclosure-number disk-number (b e d for short)`

For example, disk ID 000 (or 0_0_0) indicates the first bus or loop, first enclosure, and first disk, and disk ID 100 (1_0_0) indicates the second bus or loop, first enclosure, and first disk.

With the new DAE7S enclosure, that has multiple rows (banks) of disks, an additional information is required to define the disk location in the enclosure. For this enclosure, the bank (A - E) is required as well as the slot number, in that bank of disks, to uniquely identify the disk location. For example, disk ID 1_3_B7 refers to the second bus or loop, 4th enclosure and eighth disk within the second bank of disks. A sample VNX model system is shown in Figure 1 on page 40, including the new DAE7S enclosure with five banks of disks for a total of 60 disks

Note: AX4-5 series systems have only one back-end bus (bus-number=0). AX series systems have only one back-end bus (bus-number=0) and only one enclosure (enclosure-number=0).



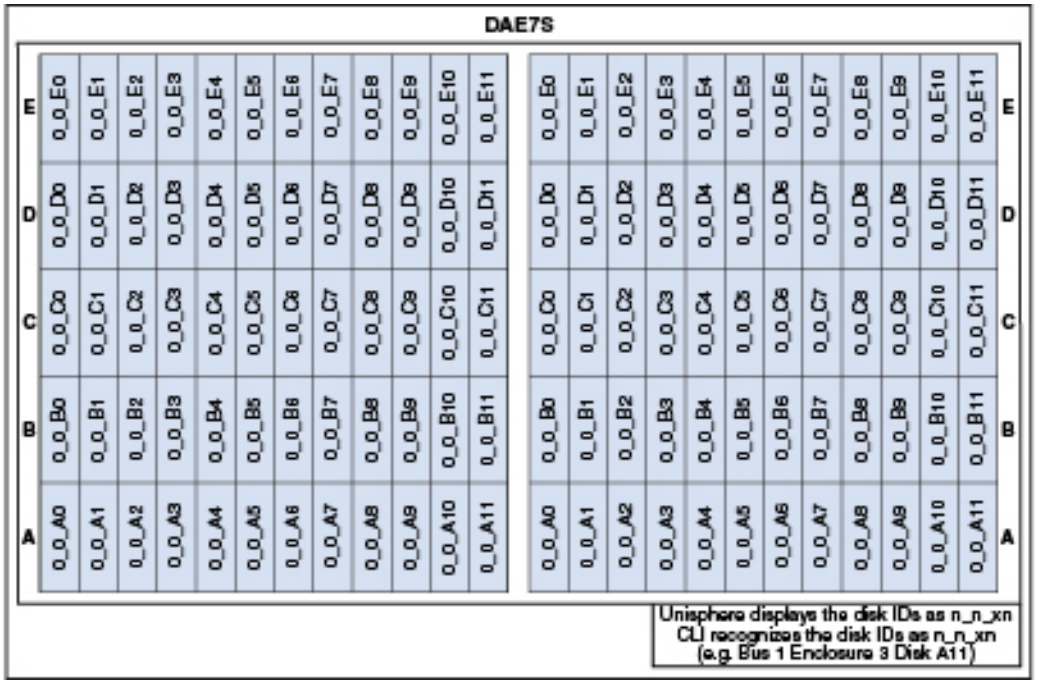


Figure 1. VNX system disk IDs

2

Navisphere CLI

This chapter includes content for CX4 UltraFlex™ series (CX4-120 systems, CX4-240 systems, CX4-480 systems, and CX4-960 systems), CX3 UltraScale™ series (CX3 model 10 systems, CX3 model 20 systems, CX3 model 40 systems, and CX3 model 80 systems), CX series, AX4-5 series, and AX series systems. For FC series and C series systems, refer to older versions of the *EMC Navisphere Command Line Interface (CLI) Reference* (P/N 069001038 Rev. A14) available on the Powerlink website.

This chapter describes the EMC® Navisphere® system management configurations and architecture.

Major topics include:

About EMC Unisphere software

The EMC Unisphere software suite is composed of the following components:

- Unisphere system Initialization Utility
- Unisphere Host and SP Agents
- Unisphere Server Utility
- Unisphere Storage Management Server
- Navisphere CLI
- Unisphere Analyzer
- Unisphere QoS Manager

About Unisphere System Initialization Utility

You must initialize the system in order to register the server HBAs and NICs with the system and have access to the system's data.

For CX4 series, CX3 series, and CX series Fibre Channel systems, use the utility to discover systems, and set network parameters (IP address, subnet mask, and default gateway). In addition, for CX3 series systems with iSCSI data ports, use the utility to set network parameters for these ports.

Note: For CX series systems, an authorized service provider must install and run the initialization utility.

For AX4-5 series and AX series systems, use the utility to discover systems, set network parameters (IP address, subnet mask, and default gateway), and create management user accounts. In addition, for AX150 iSCSI systems use the utility to set network parameters for the system's iSCSI data ports.

Note: The Unisphere Initialization Utility can be run on servers with connections to the management ports of CX4 series, CX3 series, CX700, CX500 series, CX300 series, AX4-5 series, and AX series systems. CX4 series systems must be running FLARE OE 04.28.xx.yy.z or later. CX3 series systems must be running FLARE OE 03.22.xxx.5.yyy or later. CX700, CX500 series, CX300 series, and AX100 series systems must be running FLARE OE 02.16.xxx.5.yyy or later. AX150 series systems must be running FLARE 02.20.xxx.5.yyy or later. AX4-5 series systems must be running FLARE 02.23.xxx.5.yyy.

About Unisphere Host and SP Agents

Agents relay configuration and status requests from manager to systems. Agents also periodically retrieve information from systems, and forward it on to Manager for update of the information it displays. Agents also monitor system events and can notify personnel by e-mail, page, or modem when any designated event occurs.

Host agents reside on attached hosts. SP agents reside on the storage processors (SPs), and are installed at the factory.

Note: We recommend that you always have at least one privileged user in the SP agent configuration file.

About Unisphere Server Utility

Similar to the host agent, the Unisphere Server Utility registers the server's host bus adapter (HBA) or network interface card (NIC) with the attached VNX systems, CX4 series, CX3 series, CX series, AX4-5 series, or AX series system; however, unlike the host agent, the server utility does not:

- automatically retrieve information from systems. With the server utility, you must manually update the information by starting the utility or you can create a script to run the utility.

Note: For Windows servers running version 6.20 or later, you can automatically update server information if the Registration Service feature remains enabled after installing the server utility.

- send LUN mapping information back to a CX4 series, CX3 series or CX series system. This information will not be displayed in the manager UI or CLI. To see LUN mapping information in the manager UI or CLI for a CX4 series, CX3 series or CX series system, you must use the host agent instead of the server utility.

Note: LUN mapping information is sent to AX4-5 series and AX series systems. In Unisphere, this information is displayed in the Unisphere UI or with the CLI **`-lunmapinfo`** command. In Navisphere Express, this information is displayed in the **Manage Virtual Disks** page.

- require network connectivity to the system.

Note: If you are using the server utility to upload a high-availability report to the system, you must have network connectivity.

- require that you install the utility; you can run it from the CD. However, we recommend that you install it on the server. Some features are not available unless you install the server utility on the server.

With the server utility, you can perform the functions listed below:

- Fibre Channel connections can determine if the server is configured for high availability (HA) by verifying that the server has at least one connection path to each system SP, and that PowerPath or some other failover software is running.
- Windows servers with Microsoft iSCSI initiators can use the utility to configure iSCSI connections - log on, log off, and remove an iSCSI target - and to configure mutual CHAP.
- AX4-5 series systems running Navisphere Express can use the utility to manage snapshots. If you are managing your AX series system with Unisphere or if you have a CX series system, you must use SnapView™ and the admsnap utility to manage snapshots. For more information on SnapView and admsnap, refer to the *EMC SnapView Command Line Interfaces Reference*.

If you have the host agent installed but want to use some of the features of the server utility, you must install revision 6.22.20 or later of the server utility. The registration feature of the server utility will be disabled and the host agent will be used to register the server's HBAs to the system. Prior to revision 6.22.20 of the server utility, you could not install the host agent and server utility on the same server. However, you could install them on different servers that are connected to the same system.

Note: The server utility runs on servers attached to CX4 series, CX3 series, CX series, AX4-5 series, and AX series systems. CX3 series systems must be running FLARE OE 03.22.xxx.5.yyy or later. CX series and AX100 series systems must be running FLARE 02.16.xxx.5.yyy or later. AX150 series systems must be running FLARE 02.20.xxx.5.yyy or later. AX4-5 series systems must be running FLARE 02.23.xxx.5.yyy. Not all features are supported in all revisions of the server utility. Refer to the server utility's online help for information on which features are available.

About Unisphere

Unisphere is a centralized system management tool for configuring and managing systems. It provides the following basic functionality:

- Discovery of systems
- Status and configuration information display
- Event management
- Storage configuration and allocation

Unisphere is a web-based user interface that lets you securely manage systems locally on the same LAN or remotely over the Internet, using a common browser. Unisphere resides on a system or a supported version of Windows that is running the storage management server software, and is downloaded to the browser when the storage management server software is accessed.

Note: For an AX series system, you must complete an upgrade from Navisphere Express to Unisphere. Refer to the document for upgrading a system to Unisphere and the EMC Unisphere online help.

About Storage Management Server

The Storage Management Server software is provided with Navisphere and Unisphere, and is installed and executed on each SP in a CX4 series, CX3 series, CX series, AX4-5 series, or AX series system, or optionally on a Windows XP server. All CX4 series, CX3 series, CX series (excluding the CX200 and CX300), AX4-5 series, and AX series systems leave the factory with the storage management server software installed on the SPs. Unisphere is provided with VNX and CX4 systems running R30 software.

The storage management server software performs the following functions:

- Receives and responds to requests from Unisphere
- Forwards requests to the local SP agents for processing
- Forwards status and configuration updates to Unisphere
- Replicates user and domain information to all systems in domain
- Authenticates user logins and authorizes user requests
- Logs all user logins and actions

About Navisphere CLI

Navisphere CLI pre-dates Unisphere and is in widespread use. Navisphere CLI is supported on systems running Unisphere to protect the investment made in scripting and to provide continuity within the product lines. Navisphere CLI was traditionally three separate deliverables referred to as Classic CLI (invoked with navicli), Java CLI (invoked with navicli.jar), and Secure CLI (invoked with naviseccli). Java CLI was discontinued in favor of Secure CLI several years ago. Classic CLI has been in phase out mode and is no longer supported on VNX series systems. Secure CLI is the only CLARiiON CLI variant supported on VNX series systems. Secure CLI complements and can be used as an alternative to the Unisphere UI. It provides a command line interface for system management, including storage provisioning, status and configuration information retrieval, and control. You can use the CLI to automate management functions through shell scripts and batch files. CLI commands for many functions are server-based and are provided with the host agent. The remaining CLI commands are web-based and are provided with software that runs in the system SPs. Navisphere CLI includes the Secure CLI on supported operating systems. See Chapter 1.

Note: The Navisphere CLI is supported on all CX4 series, CX3 series, CX series, AX4-5 series, and some AX series systems.

AX4-5 series systems support only Secure CLI.

The architecture of Unisphere and the CLI differ as follows:

- Unisphere is a web-based product that communicates with the storage management server software that runs on SPs or Windows servers. The SPs and servers are grouped in entities called storage domains. When you log in to a system or server within the domain, Unisphere provides a domain-based view in which you can manage your systems.
- Navisphere CLI 7.31 is a command line interface that communicates with the host agent. Web-based commands communicate with storage management server software. In the CLI, you issue commands to individual systems through a command line structure. Some commands are then directed to a server client (host agent).

The tradeoffs between Unisphere and the CLI are as follows:

Unisphere	CLI
Uses a user interface (UI) with online, context-sensitive help	Uses a command line interface with a single help file through which you find the topic you want
Requires user interaction	Uses command lines that you can type interactively or write into a shell script for automated operations

With the CLI, as with Unisphere, you can configure, control, and retrieve status from any managed system on the LAN. You can also use the CLI to automate disk-storage management functions by writing shell scripts or batch files.

Note: If you are running VMware ESX Server, you can run Navisphere CLI from ESX Server or a virtual machine (VM). If you run Navisphere CLI from ESX Server, all commands are available. If you run Navisphere CLI from a VM, commands that require the Unisphere Host Agent are not supported, since the Unisphere Host Agent is not supported on a VM. The following commands require the Unisphere Host Agent: **`server -volmap`**, **`server -register`**. For commands that you can issue to either an SP or host agent, such as **`server -getagent`** or **`server -remoteconfig`**, if you issue the command to a VM, only the SP agent type is supported.

About Unisphere Analyzer

Analyzer is a web-based tool, using a common browser, that allows an administrator to graphically examine the performance characteristics of the logical and physical entities that make up a system. Analyzer supports immediate (real-time) data display, as well as the display of previously logged data. As a result, Analyzer lets you do immediate comparisons, long-term trend analysis, and off-site performance troubleshooting/analysis.

Like Unisphere, Analyzer resides on a system or server that is running a supported version of Windows and the storage management server software, and is downloaded to the browser when the storage management server software is accessed.

Analyzer is an optional product and requires an enabler to be installed in order to retrieve usable data.

About Unisphere Quality of Service Manager

Unisphere Quality of Service (QoS) Manager lets you allocate system performance resources on an application-by-application basis. You can use QoS Manager to solve performance conflicts in consolidated environments where multiple applications share the same system. Within system capacity, QoS Manager lets you meet specific performance targets for applications, and create performance thresholds to prevent applications from monopolizing system performance.

When you use QoS Manager, you classify application I/O requests into user-defined I/O classes such as all I/O requests issued by an application or a particular host, in order to monitor performance and control the performance of this class of I/O. You specify various I/O characteristics of your applications to define your I/O classes, and set performance goals in order to meet your application's service level requirements.

QoS Manager lets you centrally manage system resources with no host footprint (no host-management or software installs required on the host).

Unisphere Environments

You start Unisphere in a supported browser on a Windows or UNIX host by entering the IP address of an SP in the system with Unisphere installed on it. The Unisphere user interface (UI) is downloaded to the Windows or UNIX host and it runs within the browser. All requests from the UI go to the storage management server software on the systems, which communicate with the SP agent. The SP agent, in turn, communicates with the FLARE or storage group software on the SPs.

Figure 2 on page 50 shows a sample Unisphere environment with Fibre Channel systems and an iSCSI system in a storage domain with various servers.

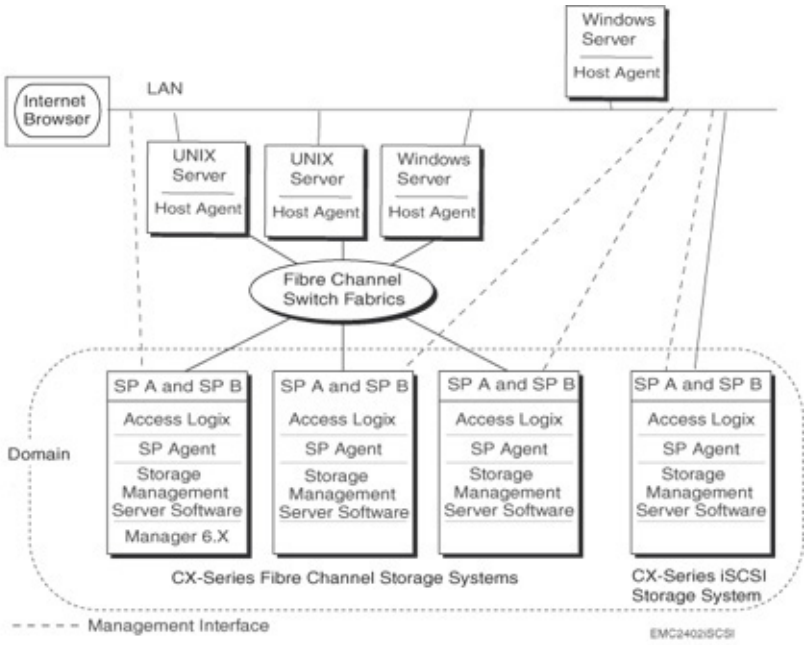


Figure 2. Fibre Channel and iSCSI systems in an IP network

System configuration and management with the CLI

Before you can configure or manage shared systems with the CLI, you need to set up the Navisphere environment. For convenience with certain operations, you may want to use Unisphere. Unisphere has a different architecture from the CLI, as explained in About Navisphere CLI on page 47.

Important: Until you enable data access control for a system, any server connected to it can write to any LUN on it. To ensure that servers do not write to LUNs that do not belong to them, the procedures below assume that either just one server is physically connected to the shared system or that just one server has been powered up since the servers were connected to the system. You will use this server (called the configuration server) to configure the system.

Installing Navisphere CLI

Install the CLI on the host you want to manage, as explained in the EMC CLARiiON server support products installation guide for your operating system.

Setting up the host or SP agent

Configure the SP agent on each SP in the system, as explained in the Unisphere online help.

Configure the host agent on the server, as explained in the EMC CLARiiON server support products installation guide for your operating system.

Configuring a system with the CLI

For an unshared storage overview, see Storage setup and management overview on page 56.

For a shared storage overview, see Shared storage setup and management overview on page 58.

Configuring and managing remote mirrors

Since the CLI communicates with the SP agent through one SP at a time, using the CLI to configure and manage a remote mirror is inefficient. We recommend that you use Unisphere to do this because it can monitor both SPs on the primary and secondary systems and can also provide a more complete picture of the remote mirror configuration and status.

AX4-5 series and AX series support

You can use Navisphere CLI with AX4-5 series and AX series systems. The CLI provides a command line interface for which you can write shell scripts to automate operations.

You must upgrade your system to Unisphere before you can use Navisphere CLI with an AX series (AX150 series and AX100 series) system. Refer to the document for upgrading a system to Unisphere.

Note: AX4-5 series systems running either Navisphere Express or Unisphere can be managed with Secure CLI. Some commands are not available with Express.

You cannot use Navisphere Express and Unisphere to co-manage an AX4-5 series and AX series system. Once you install Unisphere on an AX4-5 series or AX series systems, Navisphere Express is no longer operational. You cannot uninstall Unisphere once you install it.

We recommend that you always have at least one privileged user in the SP agent configuration file.

In general, commands supported by CX4 series, CX3 series, and CX series systems are supported by AX4-5 series and AX series systems. Because of some functionality differences, there are some commands that are unique to AX4-5 series and AX series systems and others that are not available. See the following table.

Command	Supported on		
	AX4-5 series with Unisphere	AX4-5 series with Navisphere Express	AX series with Unisphere
alpa[a]	Yes	No	Yes[a]
arraycommpath	Yes	No	No
arrayconfig	No	No	No
arrayname	Yes	Yes	Yes[a]
backendbus	No	No	No
baseuuid	No	No	No
bind	Yes[a]	Yes[a]	Yes[a]
cachecard	No	No	Yes
chglun	Yes[a]	Yes[a]	Yes[a]
chgrg	Yes[a]	Yes[a]	Yes[a]
clearstats	No	No	No

[a] Some of the switches used with this command are not supported.

Command	Supported on		
	AX4-5 series with Unisphere	AX4-5 series with Navisphere Express	AX series with Unisphere
clearlog	Yes	Yes	Yes
failovermode	Yes	No	No
faults	Yes	Yes	Yes
firmware	No	No	No
getcrus	Yes[a]	Yes[a]	Yes[b]
getsniffer	No	No	No
getresume	Yes	Yes	Yes
getall	Yes	Yes	Yes
getlun	Yes	Yes	Yes
initializearray	No	No	No
managedby	Yes	Yes	Yes
metalun	Yes[a]	Yes	Yes[a]
migrate	Yes	Yes[c]	No
mirrorview	Yes	No	No
ndu	Yes	Yes[a]	Yes[a]
remoteconfig	No	No	Yes[a]
responsetest	Yes[a]	Yes[a]	Yes[a]
rebootpeersp	Yes	Yes	Yes[d]
rebootsp	Yes	Yes	Yes
sc_off	No	No	No
setcache	Yes	No	No
setsniffer	No	No	No
setstats	No	No	No
setspstime	Yes	Yes	Yes
spportspeed	Yes	Yes	Yes
shutdown	Yes	Yes	Yes

b Some switches are supported only on AX series.
c Some switches are supported only on AX4-5 series.
d This command is supported only on AX150 series.

Command	Supported on		
	AX4-5 series with Unisphere	AX4-5 series with Navisphere Express	AX series with Unisphere
shutdownsp	Yes	Yes	No
shutdownpeersp	Yes	Yes	No
storagegroup	Yes	Yes	Yes[a]
systemtype	Yes	No	No
spportspeed	Yes	Yes	Yes

Note: Only Secure CLI commands are supported with AX4-5 series systems.

Basic commands

This section explains each of the basic variations, that is, the CLI commands that are common to all systems. Command variations for Storage Groups (Access Logix) are explained in the following chapter.

Storage setup and management overview

This section shows how you might configure and monitor a system using the **naviseccli** command. It shows commands with UNIX device names. The Windows device names would be drive letters. The system is a system, in which each SP is a host. For an overview showing systems with storage groups, see the section Shared storage setup and management overview on page 58. For systems without storage groups:

1. Create four RAID groups.

```
naviseccli -h ss1_spa createrg 0 0_0_0 0_0_1
0_0_2 0_0_3 0_0_4
```

Creates RAID group 0 from disks 0 through 4 in the DPE enclosure. A new RAID group has no RAID type until it is bound.

```
naviseccli -h ss1_spa createrg 1 0_0_5 0_0_6
```

Creates RAID group 1 from disks 5 and 6 in the DPE enclosure.

```
naviseccli -h ss1_spa createrg 2 0_0_7 0_0_8
```

Creates RAID group 2 from disks 7 and 8 in the DPE enclosure.

```
naviseccli -h ss1_spa createrg 3 0_0_9
```

Creates RAID group 3 from disk 9 in the DPE enclosure.

Note: To create RAID groups for systems running Navisphere Express, you must use the **-raidtype** switch with the **createrg** command.

2. Bind a LUN on each RAID group.

```
naviseccli -h ss1_spa bind r5 0 -rg 0
```

This command binds a LUN of type RAID 5 with LUN ID 0 on RAID group 0. The LUN occupies all space on RAID group 0, since the bind command did not include the **-cap** switch. By default, read and write caching are enabled on the new LUN.

naviseccli -h ss1_spa bind r1 1 -rg 1

This command binds a LUN of type RAID 1 (mirrored pair) with LUN ID 1 on RAID group 1. The LUN occupies all space on RAID group 1 and caching is enabled by default.

```
naviseccli -h ss1_spa bind r1 2 -rg 2
```

This command binds a LUN of type RAID 1 (mirrored pair) with LUN ID 2 on RAID group 2. The LUN occupies all space on RAID group 2, and caching is enabled by default.

```
naviseccli -h ss1_spa bind hs -rg 3
```

This command binds a hot spare on RAID group 2. The hot spare has no LUN ID (it is not really a LUN) and occupies all space on RAID group 2.

3. Get SP memory information to prepare to set up the system cache.

```
naviseccli -h ss1_spa getsp -mem
Memory Size For The SP: 930
```

Each SP has the same amount of memory, so you need not issue this command for SP B.

4. Set up system caching with 70% memory for write caching and 30% for read caching.

```
naviseccli -h ss1_spa setcache -wcza
650 -wc 1 -p 8 -rcza 280 -rczb 280 -rc 1
```

This command sets the write cache for SP A (applies to both SPs) to 650 MB, enables write caching, sets a write cache page size of 8 KB, sets a read cache size for each SP of 280 MB, and enables read caching.

For easy identification in the future, name the system.

```
naviseccli -h ss1_spa  arrayname users11
```

Change the arrayname from xxx to users11? (y/n) y

This command changes the name of the system to **`users11`** .

At this point, you can create file systems (run the appropriate host command) on the LUNs from the operating system and store data on them.

You can learn LUN device names using the **`getagent`** command and check status periodically using the **`getsp`**, **`getdisk`**, and/or **`getlun`** commands.

Shared storage setup and management overview

Storage groups provide a simple means of managing which hosts can access defined groups of LUNs. Specify host-storage group access using the unique ID (also called the world wide name, WWN) of each HBA and LUN.

Generally, you may find it easier to use Unisphere than the CLI to create and manipulate storage groups. However, the following is a sequence of tasks you can perform using only the CLI:

1. Plan the LUNs that each host will use: RAID group type, capacity, SP owner, storage group, and so on.

2. Create the RAID groups, bind the LUNs, and assign the LUNs to RAID groups using manager or the CLI. See the unshared storage overview in Storage setup and management overview on page 56 for example use of the CLI.

   Note: If you are running VMware ESX Server, you can bind LUNs from ESX Server or a virtual machine (VM).

3. Create the storage groups you want using Unisphere or the CLI command **`storagegroup -create`**.

4. Connect the hosts to storage groups using Unisphere or the CLI. Use the CLI command **`storagegroup -connecthost`** to assign a storage group to all HBAs in a host, or the command **`storagegroup -setpath`** to assign a storage group to a specific HBA in a host.

   Note: If you are running VMware ESX Server, assign ESX Server to the storage group.

5. Assign LUNs to the storage groups using Unisphere or the CLI **`storagegroup -addhlu`** command. You can assign more than one LUN to a storage group and let more than one host access a storage group.

   Note: If you are running VMware ESX Server, rescan the bus at the ESX Server level. If you are running ESX Server 2.5.x, you must then power down any virtual machine to which you will assign LUNs. If you are running ESX Server 3.x, you do not need to power down the virtual machine. At the ESX Server level, assign the LUNs to the virtual machines. When you have finished, if you are running ESX Server 2.5.x, power up the VM. If you are running ESX Server 3.x, you do not need to power up the VM.

6. As needed, reconfigure host-storage group connections using Unisphere or the CLI command **`storagegroup -sethost`**. If you need to disconnect a host from a storage group, use **`storagegroup -disconnecthost`**.

alpa -get

Displays the SCSI ID associated with an SP port

PREREQUISITES

For **naviseccli**, you must have a user account on the system on which you want to execute the command.

DESCRIPTION

The CLI **alpa** commands (Arbitrated Loop Physical Address) get and set the port ID SCSI IDs on an SP. These IDs are required for I/O to the SP.

We suggest you use a unique SCSI ID for each SP port in your installation. For example, on the first system, for ports 0 and 1, you can specify SCSI IDs 0 and 1, respectively. On the second system, for the ports you can specify IDs 2 and 3 respectively, and so on.

The **naviseccli** command **-get** function lists ALPA information. The information includes the port ID, the SP ID (A or B), and the SCSI ID associated with the port. Issue the command to the SP for which this information is needed.

If you really need to change an SP port ID, you can do so with the **alpa -set** function.

SYNTAX

```
alpa -get
```

EXAMPLE

For SP A (SP hostname `payroll_storage_spa`), this command lists the SCSI ID associated with port 0.

```
naviseccli  -h payroll_storage_spa  alpa  -get

Storage Processor: SP A
Port ID:           0
ALPA Value:        0
```

OUTPUT

See above. If the version of FLARE software running on the SP does not support this command, a `Not supported` error message is printed to `stderr`. Other errors:

```
VALID_VALUES_0_3
```

alpa -set

Updates the SCSI ID associated with an SP port

PREREQUISITES

For **naviseccli**, you must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **naviseccli alpa** command with the **-set** switch updates the SCSI ID value for the given port on an SP.

CAUTION

The SP port ID SCSI IDs are initially set by EMC service personnel to work at your site. Do not change any value unless you are installing a new SP and need to change its SCSI IDs from the SP ship values of 0 and 1.

If you change any value, after you confirm, the SP will restart and use the new values.

The software will not let you select a SCSI ID out of range (0-126) or a duplicate ID on a system. If you omit the **-o** (override) switch, then the CLI prompts for confirmation:

```
Changing the ALPA value of port port-id from old-SCSI-ID to new-SCSI-ID
(y/n)
```

To confirm, answer `y`; to take no action, answer `n`.

SYNTAX

alpa -set -sp a|b-portid *portid SCSI-ID* [**-o**]

OPTIONS

-sp a | b

Specifies the SP: A or B.

-portid *portid SCSI-ID*

Specifies the new SCSI ID to associate with the port. Port IDs range from 0 through 3 (CX3 series and CX series). Valid port SCSI IDs range from 0 through 126.

-o

Executes the command without prompting for confirmation.

EXAMPLE

For SP A, this command changes the SCSI ID associated with port 1 to 1.

```
naviseccli -h  ss1_SPA  alpa  -set -sp a -portid 1  1

This operation will cause a system reboot!
Do you wish to continue(y/n)? y
```

OUTPUT

See above. If the version of FLARE software running on the SP does not support this command, a `Not supported` error message is printed to `stderr`. Other errors:

```
VALID_VALUES_0_126

VALID_VALUES_0_3
```

arraycommpath

Sets a communication path to a system that has no LUNs bound, or removes such a path (non-storage group only)

PREREQUISITES

For **naviseccli**, you must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **naviseccli arraycommpath** command creates or removes a communication path between the server and system. Generally this command is needed when you want to configure a system that has no LUNs bound.

This command works only for systems without storage groups. For systems with storage groups, use the command **storagegroup sethost -arraycommpath** (see storagegroup on page 334).

The CLI will not issue a confirmation request first if you include the **-o** switch.

⚠ CAUTION Do not issue this command unless you know the appropriate value for the type of failover software running on the attached servers. The command is designed for transition from one type of failover software to another. Changing the arraycommpath mode to the wrong value will make the system inaccessible.

To discover the current setting of **arraycommpath**, use the command without an argument.

SYNTAX

```
arraycommpath [0 | 1] [-o]
```

OPTIONS

0

Disables a communication path.

1

Enables a communication path.

-o

Executes the command without prompting for confirmation.

EXAMPLE

This command disables the communication path between server and system. In this example, the confirmation message shows that the change, if confirmed, will cause the previous setting to be lost.

```
naviseccli  -h ss1_spa arraycommpath  0

WARNING: Previous arraycommpath setting will be lost!
DO YOU WISH TO CONTINUE? (y/n) y
```

OUTPUT

If the version of FLARE software running on the SP does not support this command, a `Not supported` error message is printed to `stderr`. Other errors:

```
Valid values are 0 or 1
```

arrayconfig -capture

Queries the system for configuration information

PREREQUISITES

You must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **arrayconfig -capture** command queries the system for its configuration along with I/O port configuration information. When issued, the command will capture a system's essential configuration data. The information is formatted and stored on the client workstation.

This generated file can be used as a template to configure other systems or rebuild the same system if the previous configuration is destroyed. The information captured may include:

- Software installed in the system (name of the software, revision, and so on).
- Physical configuration of the system (storage processors, disks, enclosures, and so on.)
- Logical configuration of the system (RAID groups, LUNs, storage groups, clones, SnapView, and mirrors).
- I/O port configuration information (hardware and logical configuration information) of a CX4 series system. You can find the hardware information in **CLARiiON ➤ Physical ➤ StorageProcessors ➤ StorageProcessor ➤ IODevices** and the logical configuration information in **CLARiiON ➤ Logicals ➤ IOPorts**.

SYNTAX

arrayconfig -capture [**-format** *XML|CSV*] [**output***path to local file name*] [**-logprogress**] [**-o**]

OPTIONS

-format *XML|CSV*

Defaults to XML if **-format** is not specified.

-logfile

Retrieves and outputs the log file stored on the targeted system.

-o

Executes the command without prompting for confirmation.

-output *path to local file name*

An XML file in the specified path and name will be created. If the indicated output file already exists, you will be asked if you wish to overwrite it.

Note: All **-capture** commands can be run with monitor privileges.

-logprogress

Displays the detailed information. If this option is not specified, displays only error information.

EXAMPLE

```
naviseccli -h ss1_spa arrayconfig -capture -output c:\Capture158.xml
-format xml
```

OUTPUT

If the command succeeds, and the XML file will be generated. There will be no message displayed in the command line.

arrayconfig -duplicate

Creates the components in the indicated configuration file on the targeted system

PREREQUISITES

Manager privileges are required to execute the **`arrayconfig -duplicate`** command.

DESCRIPTION

Issuing the **`arrayconfig -duplicate`** command creates the logical components listed in the configuration file (generated from issuing the **`arrayconfig -capture`** command) for the indicated system. You can view both the status of the duplication operation and the log file.

Before starting the duplication process, the following will be checked to ensure the targeted system qualifies for duplication:

Physical components

- The model number on the targeted system must be exactly the same as the source.
- The targeted system must have at least the same number of disks as the source (includes all RAID groups).
- The disk enclosure numbers and slot numbers should exactly match the source (includes all RAID groups).
- Drive types must match.
- The size of the targeted disks must be equal to or greater than the size of the source disks.

Software availability

- The targeted system must have all the system and Unisphere software packages available in the source system.

Logical components

The target system must be in a logically clean state. If any of the following components are available, the target is not considered clean and the command will fail:

- RAID groups
- LUNs
- User-created storage groups

Note: Duplication will not create the following logical components on the target system(s): SnapView sessions, SAN Copy information, synchronous/asynchronous mirror secondary information. If the XML captured from a mirror secondary system is used for duplication, then no mirror information will be created in the target system.

Note: While the **-capture** command supports both XML and CSV file formats, the **-duplicate** command processes information only in the XML format.

CAUTION This command creates a new configuration in the system; use it only after completely understanding the command's behavior.

SYNTAX

arrayconfig -duplicate [**-input** *path to local file name*] [**-recover**] [**-stop**] [**-rollback**] [**-status**] [**-logfile**] [**-o**]

OPTIONS

-input *path to local file name*

This is the filename of the captured information (captured from issuing the **configuration -capture** command).

-logfile

Retrieves and outputs the duplication log file stored on the targeted system.

-o

Executes the command without prompting for confirmation.

-recover

Used in a disaster recovery situation (if the system in trouble needs to be reconfigured from scratch using a configuration captured from the same system when it was healthy).

This assumes that the host connectivity and everything pertaining to the system will be the same. The initiators, the host objects and their associations with storage groups will be duplicated.

-rollback

Attempts to back out of the changes that are added to the configuration during the last duplication operation.

Changes made to the configuration after the duplication operation will not be accounted for, and may affect the rollback operation. For example, after a successful duplication, if you destroy a RAID group and create another RAID group with the same ID, the rollback will destroy the newly created RAID group as well. The rollback operates based on the object IDs stored in an internal context file. If the IDs are the same, it will not differentiate between the objects created by the previous duplication and the user-created objects.

-status

Provides a brief description of the current status of the duplication operation.

-stop

Terminates the currently running duplication operation, leaving the configuration intact at the point that the duplication ended.

Note: The **-logfile** and **-status** commands can be run with monitor privileges. All other **-duplicate** commands require manager privileges.

EXAMPLE

```
naviseccli -h ss1_spa arrayconfig -duplicate -input c:\Capture158.xml
```

arrayname

Renames a system

PREREQUISITES

For **naviseccli**, you must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **naviseccli arrayname** command changes the name of a system. If you omit a system name, the command returns the current system name (in the format host-device or system name).

Note: AX4-5 series and AX series system names cannot exceed 32 characters in length.

The CLI prompts for confirmation as follows.

SYNTAX

arrayname *NewArrayName*

OPTIONS

arrayname *NewArrayName*

Specifies the new name for the system.

EXAMPLE

This command changes the name of the system to `users11`.

```
naviseccli -h ss1_spa  arrayname users11

Change the arrayname from ss1 to users11? (y/n) y
```

OUTPUT

If the version of FLARE software running on the SP does not support this command, a `Not Supported` error message is printed to `stderr`.

backendbus -analyze

Displays speed and state information for each back-end bus and the devices on the back-end bus

PREREQUISITES

You must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **naviseccli backendbus** command with the **-analyze** function, displays the current and maximum back-end bus speeds for each back-end bus on the system, and each device (enclosures, disks, and link control cards (LCCs)) on the back-end bus. It also lists state information that includes whether a device on the bus is limiting and whether the system meets conditions required for a reset (see the list of conditions later in this section).

The current speed indicates the speed at which a bus or device is currently running; the maximum speed indicates the highest speed at which a bus or device is capable of running. If a device is limiting, it has a maximum speed lower than the maximum speed of the back-end bus. If you have a limiting device, a reset will not occur when you issue **backendbus-resetspeed**.

When you run **backendbus -analyze**, a summary analysis appears for each back-end bus to indicate whether a reset operation will be successful for the back-end bus. One of the following summary results will appear for each back-end bus.

Summary analysis[a]	Description
Speed may change on rescan	A speed-related fault exists on the back-end bus (see Description section). The CLI cannot determine whether a reset will occur.
Speed will change on rescan	A reset will occur.
Speed will not change on rescan	There are limiting devices on the back-end bus. A reset will not occur.

A speed-related fault can occur when you add a device to a back-end bus that has a maximum speed lower than the current speed of the bus. A device with a speed-related fault appears with unknown speed values; therefore, the CLI cannot determine if a reset will occur.

Note: If you issue the **backendbus -resetspeed** command, and a device with a speed-related fault exists on the bus, the reset could decrease the back-end bus speed (downgrade).

[a] If a limiting device or speed-related fault exists on the back-end bus, a listing of the limiting devices and speed-related faults appears before the summary analysis. Devices with speed-related faults appear as Devices Requesting Bypass.

Your system must meet required conditions before you can issue a reset. The following table shows the list of conditions.

Condition	Description (pass criteria)
Analyze Speed Rule	The summary analysis for the back-end bus, displayed in **backendbus -analyze**, indicates that a reset will or may occur.
System Faults Rule	No system faults can exist.
Active Sessions Rule	No active SnapView, MirrorView, or SAN Copy sessions.
Transitions Rule	No active transitions such as, LUN binds, LUN expansions, RAID group expansions, disk equalization.
I/O Rate Rule	No active I/O.

Note: Run **backendbus -analyze** before you issue **backendbus -resetspeed**.

SYNTAX

backendbus -analyze

EXAMPLE

The following example displays current and maximum back-end bus speeds for each back-end bus on the specified system and the devices on the back-end bus:

```
naviseccli -h ss1_spa backendbus -analyze
```

OUTPUT

```
naviseccli -h ss1_spa -user sysadmin -password sysadmin -scope 0 backendbus
 -analyze


Bus 0 - Current Speed: 6Gbps. Maximum speed: 6Gbps.


Device            Current       Max       Limiting    Type
-                  Speed       Speed
-------------------------------------------------------------
Bus 0 Enclosure 0   6           6           No        DAE6S
-------------------------------------------------------------
LCC A               6           6           No
LCC B               6           6           No
-------------------------------------------------------------
Disk 0              6           6           No        SAS
Disk 1              6           6           No        SAS
Disk 2              6           6           No        SAS
Disk 3              6           6           No        SAS
Disk 4              6           6           No        SAS
Disk 5              6           6           No        SAS
Disk 6              6           6           No        SAS
Disk 7              6           6           No        SAS
Disk 8              6           6           No        SAS
Disk 9              6           6           No        SAS
Disk 10             6           6           No        SAS
Disk 11             6           6           No        SAS
Disk 12             6           6           No        SAS
Disk 13             6           6           No        SAS
Disk 14             6           6           No        SAS
-------------------------------------------------------------
```

```
Bus 0 Enclosure 1   6           6           Maybe     DAE7S
-------------------------------------------------------------
ICM A               6           6           Maybe
ICM B               6           6           Maybe
LCC C               6           6           Maybe
LCC D               6           6           Maybe
-------------------------------------------------------------
Disk A0             6           6           No        SAS
Disk A1             6           3           No        SATA
Disk A2             6           6           No        SAS
Disk A3             6           3           No        SATA
Disk A4             6           3           No        SATA
Disk A5             6           3           No        SATA
Disk A6             Unknown     Unknown     No        Unknown
Disk A7             Unknown     Unknown     No        Unknown
Disk A8             Unknown     Unknown     No        Unknown
Disk A9             Unknown     Unknown     No        Unknown
Disk A10            Unknown     Unknown     No        Unknown
Disk A11            Unknown     Unknown     No        Unknown
Disk B0             6           3           No        SATA
Disk B1             6           6           No        SAS
Disk B2             6           3           No        SATA
Disk B3             6           3           No        SATA
Disk B4             6           3           No        SATA
Disk B5             6           3           No        SATA
Disk B6             Unknown     Unknown     No        Unknown
Disk B7             Unknown     Unknown     No        Unknown
Disk B8             Unknown     Unknown     No        Unknown
Disk B9             Unknown     Unknown     No        Unknown
Disk B10            Unknown     Unknown     No        Unknown
Disk B11            Unknown     Unknown     No        Unknown
Disk C0             6           3           No        SATA
Disk C1             6           3           No        SATA
Disk C2             6           3           No        SATA
Disk C3             6           3           No        SATA
Disk C4             6           3           No        SATA
Disk C5             6           3           No        SATA
Disk C6             Unknown     Unknown     No        Unknown
Disk C7             Unknown     Unknown     No        Unknown
Disk C8             Unknown     Unknown     No        Unknown
Disk C9             Unknown     Unknown     No        Unknown
Disk C10            Unknown     Unknown     No        Unknown
Disk C11            Unknown     Unknown     No        Unknown
Disk D0             6           6           No        SAS
Disk D1             6           6           No        SAS
Disk D2             6           3           No        SATA
Disk D3             6           3           No        SATA
Disk D4             6           3           No        SATA
Disk D5             6           3           No        SATA
Disk D6             Unknown     Unknown     No        Unknown
Disk D7             Unknown     Unknown     No        Unknown
Disk D8             Unknown     Unknown     No        Unknown
Disk D9             Unknown     Unknown     No        Unknown
Disk D10            Unknown     Unknown     No        Unknown
Disk D11            Unknown     Unknown     No        Unknown
Disk E0             6           3           No        SATA
Disk E1             6           3           No        SATA
Disk E2             6           3           No        SATA
Disk E3             6           3           No        SATA
Disk E4             6           3           No        SATA
Disk E5             6           3           No        SATA
Disk E6             Unknown     Unknown     No        Unknown
```

```
Disk E7             Unknown     Unknown     No        Unknown
Disk E8             Unknown     Unknown     No        Unknown
Disk E9             Unknown     Unknown     No        Unknown
Disk E10            Unknown     Unknown     No        Unknown
Disk E11            Unknown     Unknown     No        Unknown
------------------------------------------------------------

Bus 0 is currently running at 6Gbps.
Speed will not change on rescan

Analyze Speed Rule...Failed  No loop will change speed on rescan.
System Faults Rule... Failed:  Bus 0 Enclosure 1 Power A is Faulted
Active Sessions Rule... Passed
Transitions Rule... Passed
I/O Rate Rule... Passed
```

backendbus -get -connstate

Displays the connector state information

PREREQUISITES

You must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **naviseccli backendbus** command with the **-get -connstate** switches displays the connector state for the mini-Serial Attached SCSI (SAS) High Density (HD) connectors inserted into the back-end SAS ports on the onboard I/O module.

SYNTAX

```
backendbus -get -connstate
```

EXAMPLE

The following output shows the output for the **backendbus -get -connstate** command when the mini-SAS HD cable is connected on the Hypernova SLIC:

```
Bus 0

SPA Connector State: Online
SPB Connector State: Online
```

backendbus -get -prominfo

Displays information returned from the resume programmable read only memory (PROM) in the connectors

PREREQUISITES

You must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **naviseccli backendbus** command with the **-get -prominfo** switches displays the new information returned from the resume PROM in the SFP and mini-SAS HD connectors.

SYNTAX

backendbus -get -prominfo

EXAMPLE

The following example shows the output for the **backendbus -get –prominfo** command when the mini-SAS HD cable is connected on the Hypernova SLIC:

```
Bus 0

SPA SFP/Connector EMC Part Number:   019-078-042
SPB SFP/Connector EMC Part Number:   019-078-042

SPA SFP/Connector EMC Serial Number:  000000000000000
SPB SFP/Connector EMC Serial Number:  000000000000000

SPA SFP/Connector Vendor Part Number:  FTLF8528P2BNV-E5
SPB SFP/Connector Vendor Part Number:  FTLF8528P2BNV-E5

SPA SFP/Connector Vendor Serial Number:  PGL4YLY
SPB SFP/Connector Vendor Serial Number:  PGL4YLY

SPA SFP/Connector Supported Speeds:
3Gbps.
6Gbps.
SPB SFP/Connector Supported Speeds:
3Gbps.
6Gbps.
```

backendbus -get -physical

Displays physical slot and physical port ID information.

PREREQUISITES

You must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **naviseccli backendbus** command with the **-get -physical** switches displays the physical location of the back-end bus on the CX4 series system. The physical location information includes I/O module and the physical port ID.

The **backendbus -get -all** command also displays the physical location information.

SYNTAX

backendbus -get -physical [*backend bus number*]

OPTIONS

backend bus number

Specifies the back-end bus for which you want to display bus information.

EXAMPLE

```
naviseccli -h ss1_spa backendbus -get -physical
```

backendbus -get -speeds

Displays back-end bus speed information for the back-end buses on a system

PREREQUISITES

You must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **naviseccli backendbus** command with the **-get -speeds** function displays the current and available back-end bus speeds, for the back-end buses on a system. You can target a specific back-end bus and display only information for that bus, or you can display back-end bus speed information for all buses on the system.

The current speed indicates the speed the bus is currently running at; the available speed(s) indicates the speed(s) available to the back-end bus. If the current speed is less than the maximum available speed, you can run the **backendbus -analyze** command to verify if there are limiting devices on the back-end bus. If a device is limiting, it has a maximum speed lower than the maximum speed of the back-end bus. If you have a limiting device, a reset will not occur when you issue **backendbus -resetspeed**.

Use **backendbus -analyze** to display speed information for each device on a back-end bus.

SYNTAX

backendbus -get -speeds [*backend bus number*]

OPTIONS

backend bus number

Specifies the back-end bus for which you want to display bus speed information.

EXAMPLE

The following example displays current and available bus speed information for back-end bus number 2:

```
naviseccli -h ss1_spa backendbus -get -speeds 2
```

OUTPUT

```
Bus 2:

Current Speed: 2Gbps.
Available Speeds:
2Gbps.
4Gbps.
```

backendbus -get -sfpstate

Displays the current condition of each back-end SFP

PREREQUISITES

You must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **naviseccli backendbus** command with the **-get -sfpstate** function displays the current condition of each back-end SFP, which is a small form-factor pluggable (SFP) optical modular transceiver. You can target a specific back-end bus and display information for only that bus, or you can display back-end bus information for all buses on the system.

The SFP states are Online, Faulted, and Removed. Online indicates that the back-end SFP is functioning normally; Faulted indicates an unsupported or faulted SFP; and Removed indicates that it does not exist.

Use **backendbus -analyze** to display speed information for each device on a back-end bus.

SYNTAX

backendbus -get -sfpstate [*backend bus number*]

OPTIONS

backend bus number

Specifies the back-end bus for which you want to display bus information.

EXAMPLE

The following example displays the current condition for each back-end SFP:

```
naviseccli -h ss1_spa backendbus -get -sfpstate
```

OUTPUT

```
Bus 0:

SPA SFP State: Faulted
SPB SFP State: Online
```

backendbus -get -all

Displays the bus speeds, SFP state, and physical location of the bus.

PREREQUISITES

You must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **naviseccli backendbus** command with the **-get -all** function displays the bus speeds and the current condition of each back-end SFP, which is a small form-factor pluggable (SFP) optical modular transceiver for the back-end buses on a system. It displays the physical location of the back-end bus (I/O module and the physical port ID) only for the CX4 series system.You can target a specific back-end bus and display information for only that bus, or you can display back-end bus information for all buses on the system.

The current speed indicates the speed the bus is currently running at; the available speed(s) indicates the speed(s) available to the back-end bus. If the current speed is less than the maximum available speed, you can run the **backendbus -analyze** command to verify if limiting devices exist on the back-end bus. If a device is limiting, it has a maximum speed lower than the maximum speed of the back-end bus. If you have a limiting device, a reset will not occur when you issue **backendbus -resetspeed**.

The SFP states are Online, Faulted, and Removed. Online indicates that the back-end SFP is functioning normally; Faulted indicates an unsupported or faulted SFP; and Removed indicates that it does not exist.

Use **backendbus -analyze** to display speed information for each device on a back-end bus.

SYNTAX

backendbus -get -all [*backend bus number*]

OPTIONS

backend bus number

Specifies the back-end bus for which you want to display bus information.

EXAMPLE

The following example displays the bus speed, current condition, and physical location for each back-end SFP:

```
naviseccli -h ss1_spa backendbus -get -all
```

OUTPUT

```
Bus 0

Current Speed: 6Gbps.
Available Speeds:
3Gbps.
6Gbps.
SPA SFP State: N/A
SPB SFP State: N/A
I/O Module Slot: Onboard
Physical Port ID: 0

Bus 1

Current Speed: 6Gbps.
Available Speeds:
3Gbps.
6Gbps.
SPA SFP State: N/A
SPB SFP State: N/A
I/O Module Slot: Onboard
Physical Port ID: 3
```

The following output shows the output for the **backendbus -get -all** command when the mini-SAS HD cable is connected on the Hypernova SLIC:

```
Bus 0

Current Speed: 6Gbps.
Available Speeds:
3Gbps.
6Gbps.

SPA SFP State: N/A
SPB SFP State: N/A

I/O Module Slot: 1
Physical Port ID: 0

SPA Connector State: Online
SPB Connector State: Online


SPA SFP/Connector EMC Part Number:  TBD
SPB SFP/Connector EMC Part Number:  TBD

SPA SFP/Connector EMC Serial Number:  TBD
SPB SFP/Connector EMC Serial Number:  TBD

SPA SFP/Connector Vendor Part Number:  TBD
SPB SFP/Connector Vendor Part Number:  TBD

SPA SFP/Connector Vendor Serial Number:  TBD
SPB SFP/Connector Vendor Serial Number:  TBD

SPA SFP/Connector Supported Speeds:
3Gbps.
6Gbps.
SPB SFP/Connector Supported Speeds:
3Gbps.
6Gbps.
```

The following example shows the output for the **backendbus -get -all** command when the mini-SAS HD cable is connected:

```
Bus 0

Current Speed: 6Gbps.
Available Speeds:
3Gbps.
6Gbps.

SPA SFP State: N/A
SPB SFP State: N/A

I/O Module Slot: Onboard
Physical Port ID: 0

SPA Connector State: Online
SPB Connector State: Online


SPA SFP/Connector EMC Part Number: N/A
SPB SFP/Connector EMC Part Number: N/A

SPA SFP/Connector EMC Serial Number: N/A
SPB SFP/Connector EMC Serial Number: N/A

SPA SFP/Connector Vendor Part Number: N/A
SPB SFP/Connector Vendor Part Number: N/A

SPA SFP/Connector Vendor Serial Number: N/A
SPB SFP/Connector Vendor Serial Number: N/A


SPA SFP/Connector Supported Speeds:
N/A
SPB SFP/Connector Supported Speeds:
N/A
```

backendbus -resetspeed

Resets the back-end bus speeds for a system

PREREQUISITES

You must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **naviseccli backendbus** command with the **-resetspeed** function, resets the back-end bus speed for the buses on the system. When you execute **backendbus -resetspeed**, if the back-end bus is eligible for a reset and the system meets the conditions required for a back-end bus speed reset, the reset occurs. See the table below for the steps you should take before issuing **backendbus -resetspeed**.

Note: This is a disruptive operation and can take several minutes to complete. During this time the system will be offline and no I/O will be performed.

Before you execute a reset, run **backendbus -analyze** to verify the current and maximum speeds of each back-end bus and device to determine if limiting devices exist, which will prevent a reset, and to verify that your system meets the conditions required for a reset.

To verify whether the back-end bus speed reset occurs, capture the output from **backendbus -analyze** or **backendbus -get -speeds** before you execute the reset, to compare to the reset back-end bus speed values after you issue the reset.

Steps to take before issuing a reset	
1	Run **backendbus -analyze** to verify the following: ◆ back-end bus and device speed information ◆ no limiting devices exist on the back-end bus ◆ system meets required conditions
2	Save the output from **backendbus -analyze** or **backendbus -get -speeds**, to compare the bus speed in the saved output to the bus speed after you initiate **backendbus -resetspeed**,

SYNTAX

```
backendbus -resetspeed
```

EXAMPLE

The following example resets the the back-end bus speeds for the specified system:

```
naviseccli -h ss1_spa backendbus -resetspeed


WARNING: the command you are about to execute requires
that the system be completely shutdown. During this period
of time all IO to attached application hosts will be
suspended. All affected applications must be quiesced
before proceeding to avoid data unavailability and
possible data loss. This operation will take several
minutes to complete.

Are you sure you want to proceed? (y/n)?
```

OUTPUT

None if the command succeeds; status or error information if it fails.

baseuuid

Gets or sets the system unique unit identifier (UUID) base for use by a server running Tru64

PREREQUISITES

For **naviseccli**, you must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **naviseccli baseuuid** command gets or sets the base of the unique unit ID as required for servers in a Tru64 cluster. The Tru64 operating system uses the UUID (which it creates by combining the base and an offset, which is the system LUN ID) to manage the LUNs in a cluster. You can also use the UUID to manage the LUN.

To discover the UUID base, use the command without an argument.

SYNTAX

baseuuid [*uuid-base-value*]

OPTIONS

uuid-base-value

Specifies the UUID base.

EXAMPLE

These commands get, then set the UUID base of the system containing the SP ss1_spa.

```
naviseccli  -h ss1_spa  baseuuid

Base UUID of the system: 12345

naviseccli  -h ss1_spa  baseuuid  34

Base UUID of the system is set to 34.
```

OUTPUT

If the version of FLARE software running on the SP does not support this command, a `Not Supported` error message is printed to `stderr`.

bind

Creates a LUN within an existing RAID group

PREREQUISITES

For **naviseccli**, you must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **naviseccli bind** command binds a LUN within an existing RAID group. You can also create a hot spare RAID group through a single command. You can create a RAID group with the **createrg** command (see createrg on page 115).

Ensure that you address the bind command to the SP that you want to own the LUN.

Note:

As soon as a LUN is bound on a CX series system running FLARE or Access Logix version 02.04.x.xx.5.xxx or earlier, you should start a background verify on the LUN with ASAP priority and set the sniffer rate for the LUN to 5. You can perform both these operations with the setsniffer command (see the Examples section of the command). You should not send data to the LUN until the background verify operation is complete. The background verify operation will eliminate any latent soft media errors prior to use of the LUN.

As soon as a LUN is bound on a CX series system running FLARE or Access Logix software version 02.05.x.xx.5.xxx or earlier, a background verify runs automatically unless you disabled it with the -noinitialverify switch.

The following table identifies the parameters you must configure for each RAID type you bind.

Table 1. LUN parameters for different RAID types

RAID type	Bind parameters
RAID 6, RAID 5, RAID 1/0	LUN number Rebuild time Stripe size Read and/or write caching
RAID 3	LUN number Rebuild time

Table 1. LUN parameters for different RAID types *(continued)*

RAID type	Bind parameters
RAID 1	LUN number Rebuild time Read and/or write caching
RAID 0	LUN number Stripe size Read and/or write caching
Disk (individual disk unit)	LUN number Read and/or write caching
Hot Spare	LUN number

To allow for good choices of available disk modules, bind LUNs in this order:

1. First - RAID 1/0
2. Second - RAID 6, RAID 5, RAID 3, and RAID 0
3. Third - RAID 1
4. Fourth - Individual units and hot spares

Before you start binding disk modules, read the restrictions and recommendations in the following table.

Table 2. Restrictions and recommendations for binding disks into LUNs

LUN to bind	Restrictions and recommendations
Any LUN	You can bind only unbound disk modules. All disk modules in a LUN must have the same capacity to fully use the modules' storage space.
RAID 6[a]	A RAID 6 group has an even number of disks. You must bind a minimum of 4 disk modules and no more than 16 disk modules. We recommend that you bind 6 or 12 modules for more efficient use of disk space. Write caching is highly recommended, and read caching is recommended for RAID 6.
RAID 5[a]	You must bind a minimum of 3 disk modules and no more than 16 disk modules. We recommend you bind 5 modules for more efficient use of disk space.

[a] You can bind one less module per LUN than you will eventually use. However, the LUN will operate in a degraded mode until a module is installed in the empty slot and the system integrates it into the LUN.

Table 2. Restrictions and recommendations for binding disks into LUNs *(continued)*

LUN to bind	Restrictions and recommendations
RAID 3	You must bind exactly 5 or 9 disk modules. Select 5 drives for quicker rebuild times or 9 drives for more efficient use of space. Important: For RAID 3, write caching is supported only on CX3 series and CX series systems running FLARE version 02.06.xxx.x.xxx or later, or a dual-SP AX4-5 series system running Unisphere. For a system other than a CX3 series or CX series running FLARE version 02.06.xxx.x.xxx or higher, or a dual-SP AX4-5 series system running Unisphere, write-caching is not supported; therefore, when binding RAID 3 LUNs, the **-wc** *cache-flags* switch will not apply.
RAID 1	You must bind exactly 2 disk modules.
RAID 0	You must bind a minimum of 3 disk modules, and no more than 16 disk modules.
RAID 1/0	You must bind a minimum of 2 disk modules, and an even number of modules, but no more than 16 modules. Unisphere pairs modules into mirrored images in the order in which you select them. The first and second modules you select are a pair of mirrored images; the third and fourth modules you select are another pair of mirrored images; and so on. The first module you select in each pair is the primary image, and the second module is the secondary image.
Individual disk unit	None
Hot spare	You cannot bind certain disk modules as a hot spare on a system with Fibre Channel disks. For more information about such disk modules, refer to the configuration planning guide for your system. The capacity of a disk module bound as a hot spare must be at least as great as the capacity of the largest disk module that it might replace. Important: The **-c** *cache-flags* switch does not apply to a hot spare. When you check status on a hot spare, caching always appears disabled.

You can enable either read or write caching, both read and write caching, or neither type of caching for any type of LUN except for a hot spare. For caching to occur, system caching must also be enabled (see **-rc** *read-cache* for RAID group systems). Whether you should use caching for a specific LUN depends on the RAID type. Recommendations for caching with different RAID types follow.

Table 3. Caching recommendations for different RAID types

RAID type	Write caching	Read caching
RAID 0	Acceptable	Recommended

Table 3. Caching recommendations for different RAID types *(continued)*

RAID type	Write caching	Read caching
RAID 1	Acceptable	Recommended
RAID 1/0	Acceptable	Recommended
RAID 3[b]	Recommended	Recommended
RAID 5	Highly recommended	Recommended
RAID 6	Highly recommended	Recommended
Disk	Acceptable	Recommended
Hot spare	Not Allowed	Not Allowed

Note: LUNs cannot use write caching until you enable the system write cache (see **-wc** *write-cache*). LUNs cannot use read caching until you enable the read cache for the SP that owns the LUN (see **-rc** *read-cache* for RAID group systems). When binding RAID 1/0 LUNs, the order in which you select modules is important. The first module you select is the first part of the mirror's primary image and the second module is the first part of the mirror's secondary image; the third module is the second part of the primary image, the fourth module is the second part of the secondary image; and so on for any other modules in the LUN. In other words, the first and second modules selected are a pair of peer image parts, the third and fourth modules are another pair of peer image parts, and so on.

If you need to change the description (RAID type) or stripe size parameters, you must unbind the LUN (unbind on page 352), and then rebind it with the correct parameters. If you need to change the maximum rebuild time, read cache state, or write cache state, use the **chglun** command (chglun on page 102).

SYNTAX

bind *raidtype*[*lun*] **-rg** *rgID* [**-aa** *auto_assignment*] [**-cap** *capacity*][**-fastcache** **0**|**1**] [**-elsz** *stripeelement-size*]
[**-noinitialverify**] [**-offset** *logical-block-address*] [**-pl** *placement*]
[**-r** *rebuildpriority*] [**-rc** *readcache*] [**-sp** **a**|**b**] [**-sq** *size-qualifier*]
[**-v** *verifypriority*] [**-wc** *writecache*]

To create a hot spare RAID group for AX4-5 series and CX series systems, use the following syntax:

bind *raidtype*[*lun*] *disks*[**-aa** *auto_assignment*] [**-c** *cache-type*] [**-elsz** *stripe-element-size*] [**-n** *min_latency_reads*] [**-noinitialverify**]
[**-sp** **a**|**b**] [**-r** *rebuildpriority*] [**-v** *verify-priority*] [**-z** *stripe-count*]

[b] For RAID 3, write caching is supported only on CX3 series or CX series systems running FLARE version 02.06.xxx.x.xxx or later, or a dual-SP AX4-5 series system running Unisphere. Read caching is only supported on a CX3 series, CX series, or a dual-SP AX4-5 series systems running Unisphere.

OPTIONS

raid-type

Specifies the RAID type for the LUN.

r0	= RAID 0
r1	= RAID 1
r3	= RAID 3
r5	= RAID 5
r6	= RAID 6
r1_0	= RAID 1/0
id	= individual disk
hs	= hot spare

Note: RAID 6 is available only for CX series systems running FLARE 02.26.xxx.5.yyy or later, for CX3 series systems running FLARE 03.26.xxx.5.yyy or later, for CX4 series systems, and for AX4-5 series systems running FLARE 02.23.050.5.7xx or later.

All RAID types are not supported on all systems.

---

lun

Specifies a decimal number to assign to the LUN (valid range is shown in LUN IDs, unique IDs, and disk IDs on page 39). If not specified, the lowest available number (the default value) is assigned to the LUN.

-rg *rgID*

The RAID group identification number. The RAID group must already exist. You can create a RAID group with the **createrg** command (createrg on page 115).

rgID specifies a number between 0 and the maximum number of RAID groups supported by the RAID group system.

-aa *auto_assignment* **(CX series only)**

Enables or disables autoassignment functionality for the LUN. *auto_assignment* specifies functionality as follows:

0	Disables auto-assignment
1	Enables auto-assignment (the default)

-cap *capacity*

Sets the capacity of usable space in the LUN. (The default is full space available.)

-c *cache-type* **(Not supported on AX4-5 series)**

You can enable either read or write caching, both read and write caching, or neither type of caching for any LUN (logical unit) except a RAID 3 LUN or hot spare. For caching to occur, system caching must also be enabled. Whether you should use caching for a specific LUN depends on the RAID type.

For recommendations for using caching for the different RAID types, see the Description section.

cache-type specifies the type of caching used as follows:

none	no caching
read	read caching
write	write caching
rw	read and write caching

The default is read and write caching.

-fastcache 0|1

Enables or disables FAST Cache on the LUN.

-elsz *stripe-element-size* **(Not supported on AX4-5 series and AX series)**

Note: Use this option only at the direction of EMC Performance Engineering.

-noinitialverify (Not supported on AX4-5 series and AX series)

Does not perform an initial background verification. When this switch is not present, the bind performs an initial background verification on the newly bound LUN and eliminates any latent soft media errors.

-offset *logical-block-address* **(Not supported on AX4-5 series and AX series)**

Sets the LUN's starting Logical Block Address (LBA) to begin at an offset location on the RAID group, such that the user data is aligned with a stripe boundary. Enter the LBA at which user data starts in the host file system and the system will compute the correct offset automatically. The default is the lowest available disk address. Use a decimal, not hexadecimal, number. Hexadecimal numbers are not allowed. You can use the **getlun -offset** switch to learn the offset of an existing LUN.

-pl *placement* **(Not supported on AX4-5 series and AX series)**

Places a LUN in a RAID group; placement specifies which algorithm to use as follows:

bf	best fit algorithm (the default)
ff	first fit algorithm

-r *rebuild-priority* **(Not supported on AX4-5 series and AX series)**

Sets the rebuild priority, the priority at which to reconstruct data on either a hot spare or a new disk module that replaces a failed disk module in a LUN. This priority determines the resources that the SP devotes to rebuilding instead of to normal I/O activity. It applies to all RAID LUNs except RAID 0. Valid values are ASAP, High, Medium, and Low. The default is ASAP. A rebuild priority of ASAP rebuilds the disk module as quickly as possible, but degrades response time somewhat. If your site requires fast response time and you want to minimize degradation to normal I/O activity, you can extend the rebuild over a longer period of time by specifying the Low rebuild priority.

Note: You cannot change the rebuild priority for a LUN that is in the process of rebuilding. You can change the value, but it will have no effect.

The time it takes to actually rebuild a LUN can vary significantly, especially for a RAID 1/0 LUN, since a RAID 1/0 LUN with n disk modules can continue functioning with up to as many as n/2 failed drive modules and only one drive at a time is rebuilt.

Note: The rebuild priority properties are unavailable for RAID 0, disk, or hot spare LUN.

-rc *read-cache* **(AX4-5 series running Unisphere and CX series only)**

Enables or disables read cache functionality for this specific LUN. *readcache* values:

0	Disables read cache
1	Enables read cache (the default)

-sp a|b

Sets the default owner of the LUN: SP A or SP B. The default is the current SP.

-sq *size-qualifier*

Sets the default size qualifier. *size-qualifier* specifies the qualifier as follows:

mb	megabytes
gb	gigabytes (the default)
tb	terabytes
sc	stripe count
bc	block count

Note:

AX4-5 series systems support only megabyte (MB), gigabyte (GB), and terabyte (TB) size qualifiers.

The stripe count (sc) and block count (bc) size qualifiers are supported only on AX4-5 series systems running Unisphere.

-v *verify-priority* **(AX4-5 series running Unisphere and CX series only)**

Sets the priority at which the data on each LUN is verified if an SP fails and is replaced during I/O operations. *verify-priority* specifies the priority. Valid values are ASAP, High, Medium, and Low. A lower priority verifies LUN data more slowly and has less impact on overall system performance. The default is High.

Note: The verify priority properties are unavailable for RAID 0, disk, or hot spare LUN.

-wc *write-cache* **(Dual-SP AX4-5 series running Unisphere only)**

Enables or disables the system write cache for this specific LUN. *writecache* values:

0	Disables write cache
1	Enables write cache (the default).

-z *stripe-count*

Sets the number of stripes in a LUN. The *stripe-count* specifies the number of stripes. Valid values are any number greater than or equal to 0. The default is 0, which binds the maximum number of stripes available. For example, when binding a RAID 5 LUN with a stripe count of 2, partition the LUN into 2 stripes, thus preventing access to the remainder of the available space. This switch is useful for fast bind operations to produce LUNs for test purposes.

EXAMPLE

This command creates RAID group 0 from the five specified disks (disks 0 through 4 in the DPE enclosure). The new RAID group has no RAID type until it is bound (next).

```
naviseccli -h ss1_spa createrg  0 0_0_1 0_0_2 0_0_3  0_0_4  0_0_5

naviseccli -h 10.14.46.176 bind hs 66 0_0_9

Excerpt of the output of getrg:
RaidGroup ID: 1
RaidGroup Type: hot_spare
RaidGroup State: Valid_luns
List of disks: Bus 0 Enclosure 0 Disk 9
List of luns: 66
Max Number of disks: 1
Max Number of luns: 1
Raw Capacity (Blocks): 279701232
Logical Capacity (Blocks): 279701232
Free Capacity (Blocks,non-contiguous): 112
Free contiguous group of unbound segments: 112
Defrag/Expand priority: Medium
Percent defragmented: 100
Percent expanded: 100
Disk expanding onto: N/A
Lun Expansion enabled: NO
```

```
Legal RAID types: hot_spare
Hot Spare Replacing RAID Group: Inactive
```

OUTPUT

There is no output. Errors are printed to `stderr`.

cachecard -initialize

Initializes the cache memory card

PREREQUISITES

For **naviseccli**, you must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **naviseccli cachecard** command with the **-initialize** function lets you initialize the cache memory card.

The **cachecard -initialize** command can be issued under any of the following circumstances:

- a different cache memory card is installed on the system
- live data is on the cache memory card
- a LUN with an offline (cache dirty) condition exists on the system

SYNTAX

cachecard -initialize [**-o**]

OPTIONS

-o

Executes the command without prompting for confirmation.

EXAMPLE

For this example, a different cache memory card is installed on the system.

```
naviseccli -h ss1_spa cachecard -initialize


The cache memory card currently installed in this system is not the
 same as the one previously installed in
this system. In order for this system to
function properly, the current cache memory card must be
initialized on this system.

Do you want to initialize Cache Memory Card now? (y/n)?
```

OUTPUT

None if the command succeeds; status or error information if it fails.

cachecard -list

Lists the state information of the cache memory card

PREREQUISITES

For **naviseccli**, you must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **naviseccli cachecard** command with the **-list** function lists the state information of the cache memory card. The memory size and hardware state of the cache memory card is displayed.

You can choose to display only the memory size by specifying the **-size** switch or display only the hardware state by specifying the **-hwstate** switch. Without these switches, the memory size and hardware state are displayed.

The possible hardware states are listed in the following table:

Hardware state	Meaning
OK	The power on the main SP is on and the cache memory card battery is fully charged. The cache memory card is in normal operation.
Not present	The cache memory card is not present.
Faulted	The cache memory card has hardware faults.
Battery charging	The power on the main SP is on and the battery is charging on the cache memory card.
In wrong array	The cache memory card is from the wrong system.

SYNTAX

```
cachecard -list [-size] [-hwstate]
```

OPTIONS

-size

Specifies that only the total memory size of the cache memory card (MB) be displayed.

-hwstate

Specifies that only the hardware state of the cache memory card be displayed.

EXAMPLE

This command displays all state information (memory size and hardware state) of the cache memory card.

```
naviseccli -h ss1_spa cachecard -list
```

OUTPUT

```
Total Memory:    512MB
Hardware State:  Ok
```

chglun

Changes parameters on a currently bound LUN

PREREQUISITES

For **naviseccli**, you must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **naviseccli chglun** command changes parameters on a currently bound LUN. You must use at least two switches with **chglun** and one of the switches must be the LUN number **-l** *lun*.

Note: The **chglun** command does not support thin LUNs.

To change a metaLUN, use the **naviseccli** command with the**-modify** switch, as described in metalun -modify on page 375.

Table 4. Caching recommendations for different RAID types

RAID type	Write caching	Read caching
RAID 0	Acceptable	Recommended
RAID 1	Acceptable	Recommended
RAID 1/0	Acceptable	Recommended
RAID 3[1]	Recommended	Recommended
RAID 5	Highly recommended	Recommended
RAID 6	Highly recommended	Recommended
Disk	Acceptable	Recommended
Hot Spare	Not Allowed	Not Allowed

[1] For RAID 3, write caching is supported only on CX3 series, CX series system running FLARE version 02.06.xxx.x.xxx or later, or a dual-SP AX4-5 series system running Unisphere. Read caching is supported only on a CX3 series, CX series, or a dual-SP AX4-5 series system running Unisphere.

Note: LUNs cannot use write caching until you enable the write cache (set cache on page 308). LUNs cannot use read caching until you enable the read cache for the SP that owns the LUN. When binding RAID 1/0 LUNs, the order in which you select modules is important. The first module you select is the first part of the mirror's primary image and the second module is the first part of the mirror's secondary image; the third module is the second part of the primary image, the fourth module is the second part of the secondary image; and so on for any other modules in the LUN. In other words, the first and second modules selected are a pair of peer image parts, the third and fourth modules are another pair of peer image parts, and so on. Any change to the rebuild time takes effect as soon as the operation completes.

SYNTAX

```
chglun -l lun [-a autoassign] [-c cachetype] [-d defaultowner] [-dp]
[-fastcache 0|1] [-i idlethresh]
[-mp maxprefetch-blocks] [-name newname]
[-pc maxprefetch-IO] [-pd minprefetch-size] [-pf prefetchtype]
[-pm pf-size/mult] [-r rebuildpriority] [-rt retainprefetchdata]
[-sm prefetch-segmnt-size/mult] [-t idledelaytime] [-v verifypriority]
[-w writeaside]
```

OPTIONS

-l *lun*

Specifies which LUN to change. *lun* specifies the LUN number. This switch is required.

-a *auto-assign* **(CX series only)**

Enables or disables automatic reassignment of LUN ownership to an active SP if an SP failure occurs.

auto_assign specifies functionality as follows:

0	Disables autoassignment for specified LUN
1	Enables autoassignment for specified LUN

-c *cache-type* **(AX4-5 series running Unisphere and CX series only)**

Enables either read or write caching, both read and write caching, or neither type of caching for the LUN. For caching to occur, system caching must also be enabled. Whether or not you should use caching for a specific LUN depends on the RAID type. See the Table 4 on page 102.

cache-type specifies the type of caching used as follows:

none	no
caching read	read caching
write	write caching
rw	read and write caching

-d *default-owner*

Changes the default owner of the LUN. *default-owner* specifies ownership as follows:

0	Changes ownership of the LUN to SP A
1	Changes ownership of the LUN to SP B

-dp (AX4-5 series running Unisphere and CX series only)

Sets the default prefetch values.

-fastcache 0|1

Modifies the FAST Cache configuration of the LUN.

-i *idle-thresh* **(Not supported on AX4-5 series and AX series)**

Sets the maximum number of I/Os that can be outstanding to a LUN and still have the LUN be considered idle. *idle-thresh* specifies the maximum number of I/Os. Used to determine cache flush start time. Legal *idle-thresh* values range from 0 through 254.

-mp *max-prefetch-blocks* **(AX4-5 series running Unisphere and CX series only)**

Sets the maximum number of disk blocks to prefetch in response to a read request. *maxblocks* specifies the maximum number.

-name *newname*

Sets the LUN name. *newname* specifies the new name for the LUN. This switch applies only to systems running a version of FLARE software that supports storage group commands. The LUN name is displayed in the UI and has no other purpose. You cannot use the LUN name as a CLI command argument. You can assign the same name to multiple LUNs.

Note: The **-name** switch applies only to shared systems.

-pc *max-prefetch-IO* **(AX4-5 series running Unisphere and CX series only)**

Sets the maximum number of outstanding I/Os that the LUN can have and still perform prefetching. *maxIO* specifies the maximum number of I/Os. Valid values are 0 through 100.

-pd *min-prefetch-size* **(AX4-5 series running Unisphere and CX series only)**

Sets the prefetch disable size. *min-prefetch-size* specifies, in blocks, the size of the smallest read request for which prefetching is disabled. Prefetching is disabled for all read requests whose size is equal to or larger than *min-prefetch-size*. Valid values are 0 through 65534.

-pf *prefetch-type* **(Not supported on AX4-5 series and AX series)**

Sets or disables the prefetch type as follows:

0	Disables prefetch
1	Constant length prefetch type
2	Variable length prefetch type

-pm *pf-size-or-multiplier* **(AX4-5 series running Unisphere and CX series only)**

Sets the amount of data or the prefetch multiplier prefetched for one host read request as follows:

For constant length prefetching: 0-2048.

For variable length prefetching: 0-32

If *prefetchtype* (see below) is set to constant length, *pf-size-or-multiplier* specifies the number of blocks to prefetch. The valid range is 0-2048 blocks.

If *prefetchtype* is set to variable length, *pf-size*-or- *multiplier* specifies the multiplier used to determine the amount of data to prefetch. The valid range is 0-32. For example, if the value is 8, the amount of data to prefetch is 8 times the amount of data requested.

The default value for *pf-size*-or- *multiplier* is 4.

-r *rebuild-priority* **(Not supported on AX4-5 series and AX series)**

Sets the rebuild priority. *rebuild-priority* specifies the priority at which to reconstruct data on either a hot spare or a new disk module that replaces a failed disk module in a LUN. It applies to all RAID LUNs types except RAID 0 and individual disks. Valid values are ASAP, High, Medium, and Low. The default is ASAP. The priority that you specify determines the amount of resource that the SP devotes to rebuilding instead of to normal I/O activity. The default value is adequate for most situations. A rebuild priority of ASAP rebuilds the disk module as quickly as possible, but degrades response time significantly. If your site requires fast response time and you want to minimize degradation to normal I/O activity, you can extend the rebuild over a longer period of time by specifying the Low rebuild priority.

Note: It is not possible to change the rebuild priority for a LUN that is in the process of rebuilding. You can change the value, but it will have no effect.

The time it takes to actually rebuild a LUN can vary significantly, especially for a RAID 1/0 LUN, since a RAID 1/0 LUN with *n* disk modules can continue functioning with up to as many as *n*/2 failed drive modules and only one drive at a time is rebuilt.

-rt *retain-prefetch-data* **(Not supported on AX4-5 series and AX series)**

Enables or disables retaining prefetch data functionality.

retain-prefetch-data specifies functionality as follows:

0	Disables retaining prefetch data functionality
1	Enables retaining prefetch data functionality

-sm *prefetch-segmnt-size/mult* **(AX4-5 series running Unisphere and CX series only)**

Sets the segment size for data prefetched for one host read request as follows:

If **-pf** *prefetchtype* is set to constant length, *prefetch-segmnt-size/mult* specifies the size of the segment in blocks. Valid range: 0-2048 blocks.

If **-pf** *prefetchtype* is set to variable length, *prefetch-segmnt-size/mult* specifies the multiplier used to determine the segment size. Valid range: 0-32.

-t *idle-delay-time* **(AX4-5 series running Unisphere and CX series only)**

Sets the amount of time that a LUN must be below the *idle-thresh* (see below) in order to be considered idle. *idle-delay-time* specifies the delay time in 100 ms units. For example, 5 equals 500 ms. Once a LUN is considered idle, any dirty pages in the cache can begin flushing. Legal *idle-delay-time* values range from 0 through 254.

-v *verify-priority* **(AX4-5 series running Unisphere and CX series only)**

Sets the priority at which to verify data on a LUN if an SP fails and is replaced during I/O operations. *verify-priority* specifies priority level. Valid values are ASAP, High,

Medium, and Low. The lower the priority, the slower the LUN is rebuilt and the lesser the impact on overall system performance. The default is Low.

-w *write-aside* **(Dual-SP AX4-5 series running Unisphere and CX series only)**

write-aside specifies, in blocks, the largest write request size that will be written to cache. Write requests greater than the *write-aside* value are written directly to disk, bypassing write cache. Valid values are 16 through 65534.

Note: Attempting to use this switch while not in Engineering Mode will result in an error message.

EXAMPLE

Change LUN 3 to enable write caching and rebuild with high priority.

```
naviseccli -h ss1_spa chglun -l 3 -c write -r high
```

OUTPUT

There is no output. Errors are printed to `stderr`.

chgrg

Changes properties of a RAID group

PREREQUISITES

For **naviseccli**, you must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **naviseccli chgrg** command changes the properties of a specified RAID group. You must use only one of the optional switches with **chgrg** and must specify the RAID group identification number, *rgID*.

Note: The **chgrg** command does not support private RAID groups used in thin pools.

SYNTAX

chgrg *rgID* [**-defrag**] [**-expand** *disks*] [**-lex** *expansion*] [**-powersavings on**|**off**] [**-pri** *priority*] [**-rm yes**|**no**] [**-trespass** *sp*]

OPTIONS

rgID

Is the RAID group identification number. *rgID* specifies a number between 0 and the maximum number of RAID groups supported by the RAID group system.

-defrag

Starts defragmenting the specified RAID group.

-expand *disks*

Expands the RAID group *rgID* onto the disk(s) specified at a given priority, and may expand LUNs.

disks specifies the physical disks to bind. The order in which you specify the disks has no significance. See LUN IDs, unique IDs, and disk IDs on page 39 to verify the format for specifying disks.

-lex *expansion* **(Not supported on AX4-5 series and AX series)**

Available only when the **-expand** *disks* switch is used. Not available for systems that support metaLUNs. *expansion* specifies functionality as follows:

yes	Enables LUN expansion for the specified RAID group
no	Disables LUN expansion for the specified RAID group (the default)

-powersavings on|off

Configures the power savings settings. If the selected disks are not eligible for power savings settings, the system displays an error message.

-pri *priority* **(Not supported on AX4-5 series and AX series)**

Sets the priority for defragmenting or expanding the specified RAID group. *priority* specifies the process priority as follows:

high	high priority
medium	medium priority
low	low priority

-rm yes|no (Not supported on AX4-5 series and AX series)

Enables or disables the removal of the specified RAID group after the last LUN in it was unbound (unbind command). *rm*specifies the functionality as follows:

yes	Removes the RAID group
no	Does not remove the RAID group (the default)

-trespass *sp* **(Not supported on CX series, AX4-5 series, and AX series)**

Trespasses all LUNs in the RAID group to the specified storage processor. *sp* specifies the SP as follows:

a	SP A
b	SP B

EXAMPLE

This command trespasses all LUNs in RAID group 2 to SP A.

```
naviseccli -h ss1_spa chgrg 2 -trespass a
```

clearlog

Clears the SP's error log

PREREQUISITES

For **naviseccli**, you must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **naviseccli clearlog** command deletes the contents of the SP's unsolicited error log.

The command clears only the log of the SP you specify with the **-h** switch in the command.

SYNTAX

clearlog

EXAMPLE

This command deletes the SP logs of the system.

```
naviseccli -h ss1_spa clearlog

unsolicited error log cleared
```

OUTPUT

Confirmation message.

clearstats

Resets the SP's statistics logging

PREREQUISITES

For **naviseccli**, you must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **naviseccli clearstats** command resets statistics logging on the SP. If statistics logging is on, it is turned off, and then back on. If statistics logging is off, it is turned on, and then off.

The command affects only the log of the SP you specify with the **-h** switch in the command.

SYNTAX

clearstats

EXAMPLE

```
naviseccli -h ss1_spa clearstats

Statistics successfully cleared, statistics logging
disabled.
```

OUTPUT

Confirmation message.

cmdtime

Displays the date and endtime of command execution.

PREREQUISITES

For **naviseccli**, you must have a user account on the system on which you want to execute the command.

DESCRIPTION

This is a global command switch used to display the date and time at the end of each command execution. The time is displayed at the end of command output. This is an optional switch supported on all CLI commands. This switch cannot work independently.

cmdtime switch is used with the CLI commands. You must add the **-cmdtime** switch for each command to get the time information.

SYNTAX

cmdtime

OPTIONS

-cmdtime

Displays the date and end time of command execution.

EXAMPLE

```
naviseccli -h ss1_spa -cmdtime getagent


Agent Rev:           6.28.0 (1.83)
Name:                K10
Desc:
Node:                A-CF2VH072500004
Physical Node:       K10
Signature:           1962014
Peer Signature:      0
Revision:            4.28.40.1.093
SCSI Id:             0
Model:               CX4-40
Model Type:          Rackmount
Prom Rev:            0.47.00
SP Memory:           5120
Serial No:           CF2VH072500004
SP Identifier:       A
```

```
Cabinet:               SPE
CmdTime: 10/11/07 07:46:44
```

copytohotspare

Copies data from a failing disk onto an existing hot spare

PREREQUISITES

For **naviseccli**, you must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **naviseccli copytohotspare** command initiates the copying of data from a failing disk to an existing hot spare while the original disk remains functioning.

Once the copy is made, the candidate will be faulted and the hot spare activated. When the faulted disk is replaced, the replacement will be copied back from the hot spare.

SYNTAX

copytohotspare *disk-position* **-initiate** [**-0**]

OPTIONS

disk-position

This specifies the physical disk. See LUN IDs, unique IDs, and disk IDs on page 39 to verify the format for specifying disks.

-initiate

Requires the disk number of the proactive candidate, which you must specify.

-o

Executes the command without prompting for confirmation.

EXAMPLE

```
naviseccli -h ss1_spa copytohotspare 0_1_B1 -initiate
```

OUTPUT

```
The disk 0_1_B1 is selected for hot sparing. Its serial
number is KFDJ89.The proactive sparing process cannot be aborted and
may take a long time to complete. This disk should not be replaced till
its status is changed to Faulted at the end of the process. Do you wish
to continue?
```

createrg

Creates a RAID group

PREREQUISITES

For **naviseccli**, you must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **naviseccli createrg** command creates a RAID group on the specified disks. When you create a RAID group on a system running Unisphere, it has no RAID type. The new group is assigned the RAID type of the first LUN you bind on the group.

To create RAID groups on a systems running Navisphere Express, you must define the **-raidtype** switch.

Note: You cannot create private RAID groups using the createrg command.

SYNTAX

createrg *rgID disks* [**-pri** *priority*] [**-powersavings on|off**] [**-rm yes|no**] [**-raidtype r6|r5|r3|r1_0**]

OPTIONS

rgID

Is the RAID group identification number. *rgID* specifies a number between 0 and the maximum number of RAID groups supported by the RAID group system.

disks

Specifies the physical disks included in this RAID group. In a RAID 1/0 or RAID 1 configuration, you can manually select the disks for the RAID group in an order that determines the primary and secondary image. For example, for a 1/0 RAID group, the first two disks you list in the command form a pair of mirrored images, and the next two disks form another pair of mirrored images, and so on.

See LUN IDs, unique IDs, and disk IDs to verify the format for specifying disks.

Note: The disks in a RAID group must be either all Fibre Channel disks or all ATA disks.

-raidtype r6|r5|r3|r1_0

Sets the RAID type of the RAID group during the time of creation. The supported RAID types are r6, r5, r3, and r1_0. For AX4-5 series systems, RAID6 is supported only on FLARE version 02.23.050.5.7xx or later.

Important: The **-raidtype** is a mandatory switch for AX4-5 series systems running Navisphere Express. The **-raidtype** is an optional switch for AX4-5 series running Unisphere and CX series running FLARE versions 03.26.XXX or later.

This switch is not supported on AX series systems or CX series running FLARE version prior to 03.26.XXX.

You can create a hot spare RAID group for AX4-5 series and CX series systems using the disk **bind** command described in bind on page 89. You cannot create a hot spare directly for AX4-5 series systems running Navisphere Express. To create a hot spare for AX4-5 series systems running Navisphere Express use disk bind on page 89 command.

-pri *priority*

Sets the priority for expanding or defragmenting the specified RAID group. *priority* specifies the process priority as follows:

high

medium

low (the default)

-powersavings on|off

Turns the power savings settings ON or OFF on a RAID group. If **-powersavings** option is not specified, then RAID group is created with power savings off by default. If you specify disks that are not eligible for power savings settings, the system displays an error message.

-rm yes|no

Enables or disables the removal of the specified RAID group after the last LUN in it was unbound (**unbind** command). *remove* specifies the functionality as follows:

yes	Removes the RAID group
no	Does not remove the RAID group (the default)

EXAMPLE # 1

Navisphere Manager: This command creates RAID group 4 from the five specified disks, and sets the priority for the expansion/defragmenting processes to high.

```
naviseccli -h ss1_spa createrg 4 0_1 0_2 0_3 0_4 0_5 -pri high
```

EXAMPLE # 2

Navisphere Express: This command creates RAID group 1 from the five specified disks and removes the specified RAID group after the last LUN in it was unbound. This command also sets raidtype r3 to the RAID group and the priority for the expansion/defragmenting processes to high.

```
naviseccli -h ss1_spa createrg  1 0_5 0_6 0_7 0_8 0_9 -pri high
-rm yes -raidtype r3
```

emconfiguration

Configures event monitor

PREREQUISITES

For **naviseccli**, you must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **naviseccli emconfiguration** command can be used to disable event monitoring of an SP, for a specified amount of time. It will then re-enable the response after the specified time is up.

SYNTAX

emconfiguration [**-reloadconfig**] [**-disableresponse** *time*] [**-enableresponse**]

OPTIONS

-disableresponse *time*

This switch disables event monitoring of the SP for the amount of time specified. Time is indicated in minutes, with a maximum of four hours.

-enableresponse

This switch re-enables the response.

-reloadconfig

This switch will reload a template file.

EXAMPLE

```
naviseccli -h ss1_spa emconfiguration -reloadconfig
-disableresponse time -enableresponse
```

environment

Reports inlet air temperature and input power

PREREQUISITES

For **naviseccli**, you must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **environment** command displays the inlet air temperature and input power of the system, disk-array enclosures, and standby power supply through the CLI and Unisphere GUI.

SYNTAX

```
environment -list -array [-power] [-present]|[-average]
-enclosure [bus_enc|spe] [-power|-intemp [f|c]] [-present]|[-average]
-sps [-sp a|b] [-power] [-present]|[-average]
-all
```

OPTIONS

-array

Displays the present or average input power information on the system.

-power

Displays the input power information.

-present

Displays the current value, which is a sum of the present input power of all supported systems. The current value is computed as the 30-second average of the power consumption sampled every 3 seconds.

-average

Displays the average value. It requires an hour to calculate the correct value. N/A is displayed if less than 1 hour of data. The average value is computed as the 60-minute rolling average of the present power consumption values.

-enclosure

Displays the present or average inlet air temperature or input power information on a specified disk-array enclosure.

bus_enc|spe

Specifies either the bus enclosure or SPE enclosure.

-intemp f|c

Displays the inlet air temperature information. The **f** flag indicates Fahrenheit and the **c** flag indicates Celsius. The default value is **c**.

-sps

Displays the present or average input power information on a specified standby power supply.

-sp a|b

Specifies the standby power supply ID on which to display the information.

-all

Displays the following:

- System input power informmation
- Data Mover enclosure inlet air temperatures and input power information
- Array input power information
- Disk-array enclosure inlet air temperatures and input power information
- Storage processor enclosure inlet air temperatures and input power information
- Standby power supply input power information

EXAMPLE # 1

The **environment -list -all** command shows the input power data of the system, SPS, enclosures, and air inlet temperature for the DPE7 with DAE6S and DAE5S and the SPE5 with a DAE6S.

```
environment -list -all
```

```
Array

Input Power
Status: Invalid
Present (watts): N/A
Rolling Average (watts): N/A

DPE7 Bus 0 Enclosure 0

Input Power
Status: Valid
Present (watts): 200
Rolling Average (watts): 333

Air Inlet Temperature
Status: Valid
Present (degree C): 22
Rolling Average (degree C): 21

DAE6S Bus 0 Enclosure 1

Input Power
Status: Unsupported
Present (watts): N/A
Rolling Average (watts): N/A

Air Inlet Temperature
Status: Unsupported
Present (degree C): N/A
Rolling Average (degree C): N/A

DAE5S Bus 1 Enclosure 0

Input Power
Status: Sample size too small
Present (watts): 150
Rolling Average (watts): N/A

Air Inlet Temperature
Status: Sample size too small
Present (degree C): 22
Rolling Average (degree C): N/A

Bus 0 Enclosure 0 SPS A

Input Power
Status: Valid
Present(watts): 6
Rolling Average(watts): 6

Bus 0 Enclosure 0 SPS B

Input Power
Status: Valid
Present(watts): 6
Rolling Average(watts): 6
```

EXAMPLE # 2

The following example shows the output for the **environment -list -all** command for the SPE5.

```
environment -list -all


Array

Input Power
Status: Sample size too small
Present (watts): 543
Rolling Average (watts): N/A

SPE5 Enclosure SPE

Input Power
Status: Valid
Present (watts): 189
Rolling Average (watts): 194

Air Inlet Temperature
Status: Valid
Present (degree F): 70
Rolling Average (degree F): 69

DAE6S Bus 0 Enclosure 0

Input Power
Status: Sample size too small
Present(watts): 354
Rolling Average(watts): N/A

Air Inlet Temperature
Status: Sample size too small
Present(degree F): 81
Rolling Average(degree F): N/A

Bus 0 Enclosure 0 SPS A

Input Power
Status: Sample size too small
Present(watts): 6
Rolling Average(watts): N/A

Bus 0 Enclosure 0 SPS B

Input Power
Status: Sample not present
Present(watts): N/A
Rolling Average(watts): N/A
```

failovermode

Changes the type of trespass needed for failover software (non-storage group only)

PREREQUISITES

For **naviseccli**, you must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **naviseccli failovermode** command enables or disables the type of trespass needed for failover software. Use this command with certain types of failover software as suggested in the *Installation Roadmap for CLARiiON Storage Systems*, which is on the EMC Powerlink website.

The CLI may prompt for confirmation of some changes you specify unless you use the **-o** (override). To change the setting, enter `y`.

This command works for systems without storage groups only. For systems with storage groups, use the command **storagegroup sethost -failovermode** (see storagegroup on page 334).

Changing the failover mode setting will ask for confirmation unless you include the **-o** switch.

⚠ CAUTION Do not issue this command unless you know the appropriate value for the type of failover software running on the attached servers. The command is designed for transition from one type of failover software to another. Changing the failover mode to the wrong value will make the system inaccessible.

To discover the current setting of **failovermode**, use the command without an argument.

SYNTAX

failovermode [**0**|**1**|2|**3**|**4**] [**-o**]

OPTIONS

-o

Executes the command without prompting for confirmation.

EXAMPLE

For ss1_spa, this command enables failover mode 0.

```
naviseccli  -h ss1_spa  failovermode  0
```

```
WARNING: Previous Failovermode setting will be lost!
DO YOU WISH TO CONTINUE? (y/n) y
```

OUTPUT

If the version of FLARE software running on the SP does not support this command, a `Not supported` error message is printed to `stderr`. Other errors:

```
Command not Supported Valid values are 0 to 3
```

faults -list

Lists status information for faulted components on the system

PREREQUISITES

You must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **naviseccli faults** command with the **-list** function, provides status information for faulted hardware components, such as enclosures, disks, power supplies, storage processors, standby power supplies, as well as MirrorView/Asynchronous replication software sessions.

SYNTAX

```
faults -list
```

EXAMPLE

The following example lists the faulted hardware components and MirrorView software sessions on the system:

```
naviseccli -h ss1_spa faults -list
```

OUTPUT

```
Faulted Subsystem:  APM00043806491
Enclosure SPE : Faulted
Enclosure SPE Power B : Faulted
Bus 0 Enclosure 0 : Faulted
Bus 0 Enclosure 0 Disk 7 : Removed
Bus 0 Enclosure 0 Disk 8 : Removed
Bus 0 Enclosure 0 Disk 9 : Removed
Bus 0 Enclosure 0 Power B : Faulted

FAR Mirror Faults Status Report
50:06:01:60:90:60:00:14:09:00:00:00:00:00:00:00:
Asynchronous mirror is faulted

50:06:01:60:90:60:00:14:06:00:00:00:00:00:00:00:0050:06:01:
60:90:60:03:99:Asynchronous mirror image is fractured

50:06:01:60:90:60:00:14:0B:00:00:00:00:00:00:00:
Asynchronous mirror is faulted

50:06:01:60:90:60:00:14:07:00:00:00:00:00:00:00:
Asynchronous mirror is faulted

50:06:01:60:90:60:00:14:08:00:00:00:00:00:00:00:0050:06:01:
60:90:60:03:99:Asynchronous mirror image is fractured

50:06:01:60:90:60:00:14:01:00:00:00:00:00:00:00:
Asynchronous mirror is faulted

50:06:01:60:90:60:00:14:11:00:00:00:00:00:00:00:
Asynchronous mirror is faulted

50:06:01:60:90:60:00:14:12:00:00:00:00:00:00:00:0050:06:01:
60:90:60:03:99:Asynchronous mirror image is fractured
```

firmware

Updates the disk firmware

PREREQUISITES

For **naviseccli**, you must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **naviseccli firmware** command updates the disk firmware.

To update an SP's FLARE software, use the **ndu** command. To update disk firmware, use the **firmware** command as described here.

Note: After downloading firmware, the CLI prompts you if a reboot is necessary. In general, downloaded firmware is updated only after the system reboots. However, depending on what is included in the firmware file a reboot may or may not be necessary.

SYNTAX

firmware *filename* [**-c**] [**-d** *disks*] [**-w**] **[-o**]

OPTIONS

filename

Specifies the full pathname of the new firmware image on the destination server. This image contains the microcode. If the full pathname is not entered, the current working directory is added to the beginning of the filename.

-c

Specifies a client side download. Indicates that the firmware file resides on a client (the default is no). For example, if you are running the CLI from a machine that is not the system server, you can still download firmware if you specify this flag.

-d *disks*

Downloads disk vendor firmware to specified disks.

disks specifies the physical disks whose firmware will be updated. The order in which you specify the disks has no significance. See LUN IDs, unique IDs, and disk IDs on page 39 to verify the format for specifying disks.

-o

Executes the command without prompting for confirmation.

-w

Initiates a warm reboot after the firmware is downloaded. A warm reboot performs the same functions as a reboot except that the powerup diagnostics are not executed. In systems that use caching, the caches are re-initialized. A warm reboot executes in under 50 seconds.

EXAMPLE

The following example downloads `mcode.rev`, which is located in the `tmp` directory.

```
naviseccli -h ss1_spa firmware /tmp/mcode.rev -o
```

OUTPUT

A warning message appears before the command is issued to the system, if a reboot is necessary. Errors are printed to `stderr`.

flash -ioport

Flashes the LEDs on I/O ports.

PREREQUISITES

For **naviseccli**, you must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **naviseccli flash -ioport** command flashes the I/O ports on the CX5 systems. Flashes only the targeted SP owned I/O ports.

SYNTAX

flash -ioport [**-fe** *logicalportID* | **-be** *logicalportID* | **-pslotid** *"on board"*|*physicalslotID* **-pport** *physicalportID* | **-byusage** *mirrorview*] [**on**|**off**]

OPTIONS

-ioport

Controls flashing of I/O ports on the target SP I/O modules.

-fe *logicalportID*

Turns flashing on/off for the front-end port with the logical ID specified on the target SP.

-be *logicalportID*

Turns flashing on/off for the back-end port with the logical ID specified on the target SP.

-pslotid *"onboard"*|*physicalslotID* **-pport** *physicalportID*

Turns flashing on/off for an physical slot/port located on the targeted SP's I/O module. The physical slot ID refers to the I/O module slot.

-byusage *mirrorview*

Turns flashing on/off for an I/O port depending on how the I/O port is being used. The only option is mirrorview.

on|**off**

Indicates whether flashing is turned on or off.

EXAMPLE # 1

This example turns flashing **on** for a specified physical port on the onboard I/O module:

```
naviseccli -h 10.244.211.36 flash -ioport -pslotid onboard -pportid 3 on

Slot Onboard, Physical Port 3 (Uninitialized): ON
```

EXAMPLE # 2

This example turns flashing **on** by specifying a logical port ID on the onboard I/O module:

```
naviseccli -h 10.244.211.36 flash -ioport -be 3 on

Slot Onboard, Physical Port 1 (BE 3): ON
```

EXAMPLE # 3

This example turns flashing **on** by specifying the use of an I/O port on the onboard I/O module:

```
naviseccli -h 10.244.211.36 flash -ioport -fe 1 on

Slot Onboard, Physical Port 3 (FE 1): ON
```

EXAMPLE # 4

This example turns flashing **on** by specifying the use of an I/O port on the removable I/O modules:

```
naviseccli -h 10.244.211.36 flash -ioport -fe 4 off

Slot 0, Physical Port 0 (FE 4): OFF
```

EXAMPLE # 5

This example turns flashing **on** for a specified physical port on the removable I/O modules:

```
naviseccli -h 10.244.211.36 flash -ioport -pslotid 1 -pportid 0 on

Slot 1, Physical Port 0 (FE 8): ON
```

flash -iomodule

Turns the LEDs for the I/O ports on an I/O module on or off

PREREQUISITES

For **naviseccli**, you must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **naviseccli flash -iomodule** command turns the flashing LEDs on/off for all the I/O ports on a specified module on the CX5 system.

SYNTAX

flash -iomodule ["*onboard*"|*slotid*] [**on**|**off**]

OPTIONS

"*onboard*"|*slotid*

If the slotID is not specified, an error message is displayed.

on|**off**

Indicates whether flashing is turned on or off.

EXAMPLE # 1

```
naviseccli -h 10.244.211.36 flash -iomodule onboard on

I/O Module Onboard: ON
```

EXAMPLE # 2

```
naviseccli -h 10.244.211.36 flash -iomodule onboard off

I/O Module Onboard: OFF
```

EXAMPLE # 3

```
naviseccli -h 10.244.211.36 flash -iomodule 0 on

I/O Module 0: ON
```

flashleds

Turns the LEDs for disks in a specific enclosure or bus on or off

PREREQUISITES

For **naviseccli**, you must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **naviseccli flashleds** command turns on the LEDs in a specific disk-array enclosure (DPE, iDAE, or DPE) or Fibre Channel bus. The command can help you identify disks in an enclosure or bus.

SYNTAX

flashleds -e *enclosure-number* [**-b** *bus-number*] [**on**|**off**]

OPTIONS

-e *enclosure-number*

Specifies the disk-array enclosure. In each system, if there is a DPE or iDAE, it is enclosure 0. DAEs are numbered sequentially on each bus ascending from 1 (for DPE/iDAE systems) or ascending from 0 (for other system types).

-b *bus-number*

Specifies the bus-number.

on|**off**

Turns the LEDs on or off. If you omit this switch, the command turns the LEDs on.

EXAMPLE

These commands turn on the LEDs for the system that holds SP ss1_spa and then turns them off. For that system, it specifies enclosure 1, bus 0.

```
naviseccli -h ss1_sp1 flashleds -e 1 -b 0 on

naviseccli -h  ss1_sp1 flashleds -e  1 -b 0 off
```

OUTPUT

There is no output. Errors are printed to `stderr`.

getagent

Gets device names and configurations

PREREQUISITES

For **naviseccli**, you must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **naviseccli getagent** command returns the names of devices that the destination Unisphere agent controls. The command also displays descriptions of each device with which the Unisphere agent is configured to communicate. If you type the **getagent** command without switches, the CLI displays all values. With switches, the CLI displays only the values.

Each SP is a host (**-h** switch) to which you address the command. The command displays information for the agent running in the SP (the SP agent). Values for irrelevant display fields appear as NA.

Note: If you are running VMware ESX Server and issuing this command to a virtual machine (VM), it cannot target the host agent because the Unisphere Host Agent is supported only on ESX Server.

SYNTAX

getagent [**-cabinet**] [**-desc**] [**-mem**] [**-model**] [**-name**] [**-node**] [**-os**] [**-peersig**] [**-prom**] [**-rev**] [**-scsiid**] [**-serial**] [**-sig**] [**-spid**] [**-type**] [**-ver**]

OPTIONS

-cabinet

Returns a description of the cabinet type.

-desc

Returns an ASCII description of the device (taken from the Unisphere agent configuration file).

-mem

Returns, in MB, the size of the SP's memory. Each SP in the system must have the same amount of memory to make full use of the memory. Total memory can be 8, 16, 32, or 64 MB.

-model

Returns the model number of the SP.

-name

Returns the name of the device (taken from the Unisphere agent configuration file).

-node

Returns the device's location in the file system.

Note: Use the returned device name when you specify the device in a command line.

-os

Displays the operating system.

-peersig

Returns the signature of the peer SP.

-prom

Returns the revision of the SP's PROM code. Each SP in the system should be running the same revision of PROM code. PROM code is updated automatically when you update an SP's FLARE software and choose the reboot option.

-rev

Returns the microcode revision number of the FLARE software that the SP is running. Each SP in the system will be running the same revision of FLARE software. You can update an SP's FLARE software.

-scsiid

Returns the SCSI ID of SP host connection. The SCSI ID number for the SP is determined by switch settings on the SP. For information on these switch settings, see the system installation and maintenance manual.

-serial

Returns the serial number of the system.

-sig

Returns the unique SP signature.

-spid

Returns the SP identifier (A or B).

-type

Returns the model type (deskside or rackmount).

-ver

Returns the version of the agent that is running.

EXAMPLE

This example issues the **getagent** command to system ss1_spa.

```
naviseccli -h ss1_spa getagent
```

OUTPUT

The following is a sample output that shows the devices controlled by one agent. Actual output varies depending on the switches you use with the **getagent** command.

Note: For a host that is managing a legacy system, the output may vary depending upon whether or not the host is in a storage group.

Output from an SP agent

```
Agent Rev:      6.1.0 (8.4)
Name:           K10
Desc:
Node:           A-WRE00021400494
Physical Node:  K10
Signature:      588114
Peer Signature: 588069
Revision:       2.01.1.01.4.001
SCSI Id:        0
Model:          600
Model Type:     Rackmount
Prom Rev:       2.12.00
SP Memory:      2048
Serial No:      WRE00021400494
SP Identifier:  A
Cabinet:        xPE
```

The following output shows the enclosure type for VNX5100/VNX5300 Block/VNX5500 Block systems:

Cabinet: DPE7

The following output shows the enclosure type for VNX5700 Block/VNX7500 Block systems:

Cabinet: SPE5

getall

Gets comprehensive system information

PREREQUISITES

For **naviseccli**, you must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **naviseccli getall** command returns an extensive list of system information, including:

- Agent and host information
- System information
- HBA or switch information
- SP information
- Cache information
- Disk information
- LUN information
- RAID group information
- Storage group information
- SnapView information
- SAN Copy information
- Drive type for enclosures, disks, RAID groups, and LUNs

The **getall** command is a superset of the **getagent** command. If you type the **getall** command without switches, the CLI displays all values. With switches, the CLI displays only the values specified.

Note that the **getall** command and any of its arguments return all information pertinent to the current Navisphere release. The amount of this information may change (usually it increases) with each new Navisphere release. This may affect your custom command scripts that use **getall**.

The command displays information for the agent running in the SP (the SP agent). Values for irrelevant display fields appear as NA.

Some information is not displayed if the feature is not activated or not supported. For example, SAN Copy items are displayed only if SAN Copy software is installed and activated.

SYNTAX

getall [**-host**] [**-array**] [**-hba**] [**-sp**] [**-cache**] [**-disk**] [**-drivetype**] [**-fastcache**] [**-lun**] [**-reserved**] [**-rg**] [**-sg**] [**-snapviews**] [**-sancopy**]

OPTIONS

-host

Displays only information about the host and the agent that manage the system. This is a composite of information displayed by the **getagent**, **remoteconfig**, and **ndu** commands.

-array

Displays only information about the system and its hardware components such as fan and link control card (LCC). This is a composite of information displayed by the **getarrayuid**, **arrayname**, **getcrus**, and **initialiazearray** commands.

-hba

Displays information about each switch, HBA and port. It also displays the physical location of the port for a CX4 series system. This combines the information that the **alpa**, **port**, **register**, and **getloop** commands display.

-sp

Displays information about this SP only. This is a composite of information displayed by the **getsp**, **getcontrol**, **networkadmin**, and **getsptime** commands.

-cache

Displays information about the cache. This is a composite of information displayed by the **getcache** and **getconfig** commands.

-disk

Displays information about disks and enclosures in the system and new disk spin-down statistics. This is the same information that the **getdisk** command displays.

-drivetype

Displays the drive type of the LUN.

-fastcache

Displays the FAST Cache information.

-lun

Displays only information about each logical unit (host and system) in the system. This is a composite of information displayed by **getsniffer**, **storagegroup**, and **getlun** commands.

-reserved

Displays the reserved LUN pool information.

-rg

Displays only information about RAID groups. This is the same information displayed by **getrg** command.

Note: The **-rg** switch does not display the private RAID group used in thin pools.

-sg

Displays only information about storage groups. This is the same information displayed by the **storagegroup** command.

-snapviews

Displays only information about **snapview**. This is the same information displayed by the **snapview** command.

-sancopy

Displays only information about **sancopy**. This is the same information displayed by the **sancopy** command.

EXAMPLE

```
naviseccli -h ss1_spa getall
```

OUTPUT

Agent/Host information (same as returned by command getsp)

```
Server IP Address: 10.15.22.176  Server/SP IP address
Agent Rev:         5.3.0 (5.0)   Revision of the agent.
Agent/Host Information
----------------------
Desc:          MY_K10            ASCII description of device.
Node:          A-F20011000207    Device name or location in file system
                                 of device. Use this value when specifying

                                 the command line device name.
Physical Node:   K10
Signature:       196618          Unique signature of SP
Peer Signature:  176166          Unique signature of peer SP
SCSI Id:         0               SCSI id of SP host connection
SP Identifier:   A               SP Identifier (A or B)
Model:           4700-2          Model number of SP
Model Type:      Rackmount       Model Type (deskside, rackmount)
Prom Rev:        5.94.00         Prom revision.
SP Memory:       817             SP memory in megabytes.
Serial No:       F20011000207    Serial number of device.
Cabinet:         DPE             cabinet type (DPE)
Installed packages:
Name of the software package:Base Package name
Revision of the software package:
01_89_35                         Package revision
Commit Required:   NO            YES / NO
Revert Possible:   NO            YES / NO
Active State:      YES           YES / NO
Dependent packages:              Dependency information
MirrorView 01_89_25, Navisphere
5.3.0
Required packages:               Required package revision information
Navisphere >5.2.0.0.0, Base
<01_89_99, Base >01_80_00,
Is installation completed: YES   YES / NO
Is this System Software:   NO    YES / NO
```

System information (**-array** switch) (same information is returned by commands **getcrus** and **initializearray -list**).

```
Array Information
-----------------
Array Name: Array_2
Array UID:
50:06:01:60:20:04:A0:CF
Array Name: Storage_2                  Storage-system name
Array UID:  50:06:01:60:20:04:A0:CF    Storage-system
                                       16-byte unique
                                       identification number

DAE/SP Bus 0 Enclosure 0               Customer replaceable
                                       unit (CRU)
                                       information

Bus 0 Enclosure 0 Fan A State: Present
Bus 0 Enclosure 0 Fan B State: Present
Bus 0 Enclosure 0 Power A State: Present
Bus 0 Enclosure 0 Power B State: Present
SP A State: Present
SP B State: Present
Bus 0 Enclosure 0 SPS A State: Present
Bus 0 Enclosure 0 SPS B State: Present
Bus 0 Enclosure 0 LCC A State: Present
Bus 0 Enclosure 0 LCC B State: Present
Bus 0 Enclosure 0 LCC A Revision: 3
Bus 0 Enclosure 0 LCC B Revision: 3
Bus 0 Enclosure 0 LCC A Serial #: F4001020156
Bus 0 Enclosure 0 LCC B Serial #: N/A
DAE Bus 0 Enclosure 1
Bus 0 Enclosure 1 Fan A State: Present
Bus 0 Enclosure 1 Power A State: Present
Bus 0 Enclosure 1 Power B State: Present
Bus 0 Enclosure 1 LCC A State: Present
Bus 0 Enclosure 1 LCC B State: Present
Bus 0 Enclosure 1 LCC A Revision: 3
Bus 0 Enclosure 1 LCC B Revision: 0
Bus 0 Enclosure 1 LCC A Serial #: F4001080137
Bus 0 Enclosure 1 LCC B Serial #: N/A

(The CRU display continues for each enclosure on bus 0, then
for each enclosure on bus 1)

Raid Group ID:      223            Information about the
Logical Units Used: 223            PSM LUN (created at
List of disks:           Bus 0     system installation)

Enclosure 0 Disk 2
Bus 0 Enclosure 0 Disk 3
Bus 0 Enclosure 0 Disk 4
Bus 0 Enclosure 0 Disk 5
Bus 0 Enclosure 0 Disk 6


HBA or Switch information
HBA Information
---------------
Information about each HBA:
Information about each HBA:
HBA UID:                                            HBA 32-byte unique
01:02:03:04:05:06:07:08:09:0A:0B:0C:0D:0E:01:12 identification number
Server Name: navi2280.us.dg.com                     Server name.
```

```
Server IP Address: 12.34.56.78                  Server IP address.
HBA Model Description:                          If any
HBA Vendor Description:                         If any
HBA Device Driver Name:                         If any

Information about each port of this HBA:
SP Name:                    SP A                SP (A or B)
SP Port ID:                 0                   Can be 0 through 3.
HBA Devicename:             N/A                 Name in file system if
                                                available
Trusted:                    NO                  YES or NO
Logged In:                  NO                  YES or NO
Defined:                    YES                 YES or NO
Initiator Type:             0                   Can be 0 through 3
StorageGroup Name:          Server1_SG          Storage group(s) on
                                                this port

(HBA and HBA port listings continue here.)
Information about each SPPORT:
SP Name:                    SP A                A or B
SP Port ID:                 0                   0 to 3
SP UID:                                         32-byte unique ID
50:06:01:60:20:04:A0:CF:50:06:01:60:40:04:A0:CF number of SP

Link Status:                Down                Up or Down
Port Status:                DISABLED            Enabled or Disabled
Switch Present:             NO                  YES or NO
ALPA Value:                 0                   0 to 255
Speed Value:                1                   Speed of 1 or 2 Gbs
(SP A and SP B port information appears here.)


SP Information
--------------
Storage Processor:              SP A            A or B
Storage Processor Network Name: naviqa22176     Network information
Storage Processor IP Address:   10.15.22.176
Storage Processor Subnet Mask:  255.255.255.0
Storage Processor Gateway Address: 10.15.22.1

System Fault LED:               OFF             Status of fault LED.
Statistics Logging:             ON              Serve for performance
                                                monitoring
System Date:                    08/15/2001      SP clock information
Day of the week:                Wednesday
System Time:                    08:37:
Max Requests:                   1               Performance
Average Requests:               4294967295      information (recorded
Prct Busy:                      0               only if Statistics
Prct Idle:                      0               logging is on)
Hard errors:                    0
Read_requests:                  0
Write_requests:                 0
Total Reads:                    0
Total Writes:                   0
Blocks_read:                    0
Blocks_written:                 0
Sum_queue_lengths_by_arrivals:  0
Arrivals_to_non_zero_queue:     0
Hw_flush_on:                    0
Idle_flush_on:                  31
Lw_flush_off:                   0
```

```
Write_cache_flushes:            0
Write_cache_blocks_flushed:     0
Internal bus 1 busy ticks:      4294967295
Internal bus 1 idle ticks:      4294967295
Internal bus 2 busy ticks:      0
Internal bus 2 idle ticks:      0
Internal bus 3 busy ticks:      0
Internal bus 3 idle ticks:      0
Internal bus 4 busy ticks:      0
Internal bus 4 idle ticks:      0
Internal bus 5 busy ticks:      0
Internal bus 5 idle ticks:      0
Controller busy ticks:          20787
Controller idle ticks:          1617657

(SP B information appears here.)
```

The physical slot and physical port information for the SP ports that the **getall** command with the **-hba** switch returns.

```
Information about each SPPORT:

SP Name:                         SP A
SP Port ID:                      0
SP UID:
50:06:01:60:B9:A0:13:86:50:06:01:60:39:A0:13:86
Link Status:                     Up
Port Status:                     Online
Switch Present:                  YES
Switch UID:
10:00:08:00:88:E3:0A:EF:20:1D:08:00:88:E3:0A:EF
SP Source ID:                    7871763
ALPA Value:                      0
Speed Value :                    4Gbps
Auto Negotiable :                NO
Available Speeds:                1Gbps
                                 2Gbps
                                 4Gbps
                                 Auto
Requested Value:                 Auto
MAC Address:                     Not Applicable
SFP State:                       Online
Reads:                           0
Writes:                          0
Blocks Read:                     0
Blocks Written:                  0
Queue Full/Busy:                 0
I/O Module Slot :                1
Physical Port ID :               3
Usage:                           General
SP Name:                         SP A
SP Port ID:                      1
SP UID:
50:06:01:60:B9:A0:13:86:50:06:01:61:39:A0:13:86
Link Status:                     Down
Port Status:                     DISABLED
Switch Present:                  NO
ALPA Value:                      0
Speed Value :                    N/A
Auto Negotiable :                YES
Available Speeds:                1Gbps
                                 2Gbps
                                 4Gbps
                                 Auto
Requested Value:                 Auto
MAC Address:                     Not Applicable
SFP State:                       Online
Reads:                           0
Writes:                          0
Blocks Read:                     0
Blocks Written:                  0
Queue Full/Busy:                 0
I/O Module Slot :                0
Physical Port ID :               2
Usage:                           General
```

Management port information returned by the command **`getall -sp`** (The information is the same as returned by command **`networkadmin -get -all`**).

```
SP Information
--------------------
Storage Processor: SP A
Storage Processor Network Name: OEM-2MYA58ZGAQT
Storage Processor IP Address: 10.4.78.158
Storage Processor Subnet Mask: 255.255.255.0
Storage Processor Gateway Address: 10.4.78.1

Management Port Settings:
Current Speed: 100 Mbps/half duplex
Requested Speed: 100 Mbps/half duplex
Link Status: Link-up
Auto-Negotiate: No
Capable Speeds:
10 Mbps half/full duplex
100 Mbps half/full duplex
1000 Mbps half/full duplex
Auto
```

Sample output displaying resume information that the **getall -resume** command for the SPE enclosure on a CX4 series system returns.

```
Server IP Address:            10.14.20.175
Agent Rev:                    6.28.0 (1.38)

Resume Information
----------------------
Enclosure SPE
  Chassis/Midplane
    EMC Part Number:              100-562-266
    EMC Artwork Revision:         N/A
    EMC Assembly Revision:        A01
    EMC Serial Number:            HK100072600036
    Vendor Part Number:           N/A
    Vendor Artwork Number:        N/A
    Vendor Assembly Number:       N/A
    Vendor Serial Number:         N/A
    Vendor Name:                  N/A
    Location of Manufacture:      Hopk,MA USA
    Year of Manufacture:          2007
    Month of Manufacture:         07
    Day of Manufacture:           11
    Assembly Name:                DREADNOUGHT
DVT CHASSIS
    Programmable Name:            N/A
    Programmable Revision:        N/A
    EMC Product Serial Number:    XXXXXXXXXXXXXX
    EMC Product Part Number:      900-XXX-XXX
    EMC Product Revision:         XX.XX.XX

Bus 0 Enclosure 0
Chassis/Midplane
EMC Part Number:100-561-622
EMC Artwork Revision: D05
EMC Assembly Revision: A08
EMC Serial Number:FCNST064401287
Vendor Part Number: N/A
Vendor Artwork Number: N/A
Vendor Assembly Number: N/A
Vendor Serial Number: N/A
Vendor Name: FOXCONN,SHENZHEN, CHINA
Location of Manufacture: LONGHUA TOWN, SHENZHEN,
CHINA
Year of Manufacture: 2006
Month of Manufacture: 10
Day of Manufacture: 30
Assembly Name: 4GB FC DAE STILETTO W/ FLANGES
Programmable Name: N/A
Programmable Revision: N/A

Bus 1 Enclosure 0
Chassis/Midplane
EMC Part Number:100-561-622
EMC Artwork Revision: D05
EMC Assembly Revision: A08
EMC Serial Number: FCJST064500188
Vendor Part Number: N/A
Vendor Artwork Number: N/A
Vendor Assembly Number: N/A
Vendor Serial Number: N/A
Vendor Name: FOXCONN,SHENZHEN, CHINA
Location of Manufacture: LONGHUATOWN, SHENZHEN,
CHINA
```

```
Year of Manufacture: 2006
Month of Manufacture: 11
Day of Manufacture: 09
Assembly Name: 4GB FCDAE STILETTO W/ FLANGES
Programmable Name: N/A
Programmable Revision: N/A
```

SP cache information (same as returned by commands **getcache** and **getcontrol**).

```
Cache Information
-----------------
System Buffer (spA):               58 MB
System Buffer (spB):               58 MB
SP Read Cache State                Enabled
SP Write Cache State               Enabled
Cache Page size:                   2
Write Cache Mirrored:              YES
Low Watermark:                     40
High Watermark:                    60
SPA Cache pages:                   60657
SPB Cache pages:                   0
Unassigned Cache Pages:            0
Read Hit Ratio:                    29
Write Hit Ratio:                   0
Prct Dirty Cache Pages =           0
Prct Cache Pages Owned =           49
SPA Read Cache State               Enabled
SPB Read Cache State               Enabled
SPA Write Cache State              Enabled
SPB Write Cache State              Enabled
SPS Test Day:                      Saturday
SPS Test Time:                     21:00
SPA Physical Memory Size =         817
SPA Free Memory Size =             399
SPB Physical Memory Size =         817
SPB Free Memory Size =             409
SPA Read Cache Size =              110
SPA Write Cache Size =             250
SPA Optimized Raid 3 Memory Size = 0
SPB Read Cache Size =              100
SPB Write Cache Size =             250
SPB Optimized Raid 3 Memory Size = 0
HA Cache Vault= Not Available
```

Disk information (same as **getdisk** returns) and HBA information.

```
naviseccli -h 10.14.46.236 getall -disk
```

```
Server IP Address:              10.14.46.236
Agent Rev:                      6.30.0 (1.34)

All Disks Information
---------------------
Bus 2 Enclosure 0 Disk 0
Vendor Id:                      SEAGATE
Product Id:                     STT34007 CLAR400
Product Revision:               C003
Lun:                            Unbound
Type:                           N/A
State:                          Unbound
Hot Spare:                      NO
Prct Rebuilt:                   Unbound
Prct Bound:                     Unbound
Serial Number:                  3RJ0QQPS
Sectors:                        0 (0)
Capacity:                       375600
Private:                        Unbound
Bind Signature:                 0x0, 0, 0
Hard Read Errors:               0
Hard Write Errors:              0
Soft Read Errors:               0
Soft Write Errors:              0
Read Retries:                   N/A
Write Retries:                  N/A
Remapped Sectors:               N/A
Number of Reads:                0
Number of Writes:               0
Number of Luns:                 0
Raid Group ID:                  This disk does not belong to a RAIDGroup
Clariion Part Number:           DG118032576
Request Service Time:           N/A
Read Requests:                  0
Write Requests:                 0
Kbytes Read:                    0
Kbytes Written:                 0
Stripe Boundary Crossing:       None
Drive Type:                     Fibre Channel
Clariion TLA Part Number:       005048775
User Capacity:                  0
Idle Ticks:                     157286
Busy Ticks:                     0
Current Speed:                  4Gbps
Maximum Speed:                  4Gbps
Queue Max:                      N/A
Queue Avg:                      N/A
Prct Idle:                      1
Prct Busy:                      0
Hardware Power Savings Qualified:NO
Hardware Power Savings Eligible: NO
Power Savings State:             Full Power
Current Power Savings Log Timestamp: 06/24/09 12:48:23
Spinning Ticks:                  0
Standby Ticks:                   0
Number of Spin Ups:              0
(Information appears here for additional disks on bus in this enclosure,
then
on other bus 0 enclosures, then on bus 1 and each bus 1 enclosure.)
```

```
LUN information (same information as returned
by command getlun)
All logical Units Information
----------------------------
LOGICAL UNIT NUMBER 0
Name                      LUN 0
UID:
60:06:01:F9:02:6C:00:00:CC:F3:8F:5F:A5:8D:
D5:11
Is Private:               NO
Snapshots List: None
MirrorView Name if any:  Not Mirrored
Dual Simultaneous Access:N/A
Prefetch size (blocks) =         0
Prefetch multiplier =            4
Segment size (blocks) =          0
Segment multiplier =             4
Maximum prefetch (blocks) =      512
Prefetch Disable Size (blocks) = 129
Prefetch idle count =            40
Variable length prefetching      YES
Prefetched data retained         YES


Read cache configured according to        Read cache information
specified parameters.
Bus 0 Enclosure 0 Disk 0 Enabled
Bus 0 Enclosure 0 Disk 1 Enabled
Bus 0 Enclosure 0 Disk 7 Enabled
Bus 0 Enclosure 0 Disk 8 Enabled
Bus 0 Enclosure 0 Disk 9 Enabled
Total Hard Errors:           0            Hard read and write errors
Total Soft Errors:           0            Soft (correctable) errors
Total Queue Length:          0
RAID-3 Memory Allocation:    0

Minimum latency reads        N/A
Read Histogram[0]  0
Read Histogram[1]  0
(Read Histogram 2 through 10 information
appears.)

Write Histogram[0] 0                      Performance information
Write Histogram[1] 0                      (recorded only if statistics
(Write Histogram 2 through 10 information logging is on)
appears.)

Read Requests:              0
Write Requests:             0
Blocks read:                0
Blocks written:             0
Read cache hits:            0
Read cache misses:          0
Prefetched blocks:          0
Unused prefetched blocks:   0
Write cache hits:           0
Forced flushes:             0
Read Hit Ratio:             0
Write Hit Ratio:            0
```

```
RAID Type:                  RAID5          RAID type
RAID Group ID:              0              Group ID
State:                      Bound          State
Stripe Crossing:            0
Element Size:               128
Current owner:              SP B
Offset:                     0
Auto-trespass:              DISABLED
Auto-assign:                DISABLED
Write cache:                ENABLED
Read cache:                 ENABLED
Idle Threshold:             0
Idle Delay Time:            20
Write Aside Size:           1023
Default Owner:              SP B
Rebuild Priority:           ASAP
Verify Priority:            Low
Prct Reads Forced Flushed:  0
Prct Writes Forced Flushed: 0
Prct Rebuilt:               100
Prct Bound:                 100
LUN Capacity(Megabytes):    1024
LUN Capacity(Blocks):       2097152
(Listing for additional LUNs appears here.)

LOGICAL UNIT NUMBER 1018
Prefetch size (blocks) =         0
Prefetch multiplier =            4
Segment size (blocks) =          0
Segment multiplier =             4
Maximum prefetch (blocks) =      4096
Prefetch Disable Size (blocks) = 4097
Prefetch idle count =            40

Variable length prefetching      YES
Prefetched data retained         YES

Read cache configured according to
specified parameters.

Total Hard Errors:    0
Total Soft Errors:    0
Total Queue Length:   68
Name LUN              49
Minimum latency reads N/A

Read Histogram[0] 0
Read Histogram[1] 0
Read Histogram[2] 0
Read Histogram[3] 0
Read Histogram[4] 0
Read Histogram[5] 0
Read Histogram[6] 0
Read Histogram[7] 0
Read Histogram[8] 0
Read Histogram[9] 0
Read Histogram overflows 0

Write Histogram[0] 0
Write Histogram[1] 0
Write Histogram[2] 0
```

```
Write Histogram[3] 0
Write Histogram[4] 0
Write Histogram[5] 0
Write Histogram[6] 0
Write Histogram[7] 0
Write Histogram[8] 0
Write Histogram[9] 0
Write Histogram overflows 0

Read Requests:                0
Write Requests:               0
Blocks read:                  0
Blocks written:               0
Read cache hits:              0
Read cache misses:            N/A
Prefetched blocks:            0
Unused prefetched blocks:     0
Write cache hits:             0
Forced flushes:               0
Read Hit Ratio:               N/A
Write Hit Ratio:              N/A
RAID Type:                    RAID5
RAIDGroup ID:                 5
State:                        Faulted
Stripe Crossing:              0
Element Size:                 128
Current owner:                Unknown
Offset:                       0
Auto-trespass:                ENABLED
Auto-assign:                  ENABLED
Write cache:                  ENABLED
Read cache:                   ENABLED
Idle Threshold:               0
Idle Delay Time:              20
Write Aside Size:             2048
Default Owner:                SP A
Rebuild Priority:             ASAP
Verify Priority:              ASAP
Prct Reads Forced Flushed:    0
Prct Writes Forced Flushed:   0
Prct Rebuilt:                 100
Prct Bound:                   100
LUN Capacity(Megabytes):      1024
LUN Capacity(Blocks):         2097152
UID:
60:06:01:60:00:D0:16:00:F2:A2:8C:8D:FB:C
7:D6:11
Blocks Read SPA:              0
Blocks Read SPB:              0
Blocks Written SPA:           0
Blocks Written SPB:           0
Read Requests SPA:            0
Read Requests SPB:            0
Write Requests SPA:           0
Write Requests SPB:           0
LUN Busy Ticks SPA:           0
LUN Busy Ticks SPB:           0
LUN Idle Ticks SPA:           0
LUN Idle Ticks SPA:           0

Number of arrivals with non-zero queue:
0
```

```
Sum queue lengths by arrivals:
0
Statistics logging start time:
09/28/02 13:08:32.0
Statistics logging current time:
09/28/02 09:40:43.0
Explicit Trespasses SPA:
0
Explicit Trespasses SPB:
0
Explicit Trespasses: 0
Implicit Trespasses SPA:
0
Implicit Trespasses SPB:
0
Implicit Trespasses: 0
Non-zero Request Count Arrivals SPA:
0
Non-zero Request Count Arrivals SPB:
0
Non-zero Request Count Arrivals:
0
Sum of Oustanding Requests SPA: 0
Sum of Oustanding Requests SPB: 0
Sum of Oustanding Requests: 0
Bus 0 Enclosure 1 Disk 0 Queue Length:
0
Bus 0 Enclosure 1 Disk 1 Queue Length:
0
Bus 0 Enclosure 1 Disk 2 Queue Length:
0
Bus 0 Enclosure 1 Disk 0 Hard Read
Errors: 0
Bus 0 Enclosure 1 Disk 1 Hard Read
Errors: 0
Bus 0 Enclosure 1 Disk 2 Hard Read
Errors: 0
Bus 0 Enclosure 1 Disk 0 Hard Write
Errors: 0
Bus 0 Enclosure 1 Disk 1 Hard Write
Errors: 0
Bus 0 Enclosure 1 Disk 2 Hard Write
Errors: 0

Bus 0 Enclosure 1 Disk 0 Soft Read
Errors: 0
Bus 0 Enclosure 1 Disk 1 Soft Read
Errors: 0
Bus 0 Enclosure 1 Disk 2 Soft Read
Errors: 0
Bus 0 Enclosure 1 Disk 0 Soft Write
Errors: 0
Bus 0 Enclosure 1 Disk 1 Soft Write
Errors: 0
Bus 0 Enclosure 1 Disk 2 Soft Write
Errors: 0

Bus 0 Enclosure 1 Disk 0 Removed
Reads:           0
Writes:          0
Blocks Read:     0
Blocks Written:  0
```

```
Queue Max:       N/A
Queue Avg:       N/A
Avg Service Time:N/A
Prct Idle:       Not Available
Prct Busy:       Not Available
Remapped Sectors:N/A
Read Retries:    N/A
Write Retries:   N/A

Bus 0 Enclosure 1 Disk 1 Removed
Reads:           0
Writes:          0
Blocks Read:     0
Blocks Written:  0
Queue Max:       N/A
Queue Avg:       N/A
Avg Service Time:N/A
Prct Idle:       Not Available
Prct Busy:       Not Available
Remapped Sectors:N/A
Read Retries:    N/A
Write Retries:   N/A

Bus 0 Enclosure 1 Disk 2 Enabled
Reads:           4
Writes:          0
Blocks Read:     28
Blocks Written:  0
Queue Max:       N/A
Queue Avg:       N/A
Avg Service Time:N/A
Prct Idle:       99.99
Prct Busy:       0.00
Remapped Sectors:N/A
Read Retries:    N/A
Write Retries:   N/A
Is Private:      YES
Usage:           Unknown
Snapshots List:  Not Available
MirrorView Name if any: Not
Available

LOGICAL UNIT NUMBER 4
Prefetch size (blocks) =         0
Prefetch multiplier =            0
Segment size (blocks) =          0
Segment multiplier =             0
Maximum prefetch (blocks) =      0
Prefetch Disable Size (blocks) = 0
Prefetch idle count =            0

Prefetching: NO
Prefetched data retained NO

Read cache configured according to
specified parameters.

Total Hard Errors:    0
Total Soft Errors:    0
Total Queue Length:   0
Name                  LUN 4
Minimum latency reads N/A
```

```
RAID Type:              N/A
RAIDGroup ID:           N/A
State:                  Bound
Stripe Crossing:        0
Element Size:           0
Current owner:          SP A
Offset:                 N/A
Auto-trespass:          DISABLED
Auto-assign:            DISABLED
Write cache:            ENABLED
Read cache:             ENABLED
Idle Threshold:         0
Idle Delay Time:        0
Write Aside Size:       0
Default Owner:          SP A
Rebuild Priority:       ASAP
Verify Priority:        ASAP
Prct Reads Forced Flushed:  0
Prct Writes Forced Flushed: 0
Prct Rebuilt:               100
Prct Bound:                 100
LUN Capacity(Megabytes):    100
LUN Capacity(Blocks):       204800
UID:
60:06:01:60:00:D0:16:00:48:77:A8:54:55:C
2:D6:11
Bus 0 Enclosure 0 Disk 0 Queue Length:
0
Bus 0 Enclosure 0 Disk 1 Queue Length:
0
Bus 0 Enclosure 0 Disk 2 Queue Length:
0
Bus 0 Enclosure 0 Disk 3 Queue Length:
0
Bus 0 Enclosure 0 Disk 4 Queue Length:
0
Bus 0 Enclosure 0 Disk 0 Hard Read
Errors: 0
Bus 0 Enclosure 0 Disk 1 Hard Read
Errors: 0
Bus 0 Enclosure 0 Disk 2 Hard Read
Errors: 0
Bus 0 Enclosure 0 Disk 3 Hard Read
Errors: 0
Bus 0 Enclosure 0 Disk 4 Hard Read
Errors: 0
Bus 0 Enclosure 0 Disk 0 Hard Write
Errors: 0
Bus 0 Enclosure 0 Disk 1 Hard Write
Errors: 0
Bus 0 Enclosure 0 Disk 2 Hard Write
Errors: 0
Bus 0 Enclosure 0 Disk 3 Hard Write
Errors: 0
Bus 0 Enclosure 0 Disk 4 Hard Write
Errors: 0
Bus 0 Enclosure 0 Disk 0 Soft Read
Errors: 0
Bus 0 Enclosure 0 Disk 1 Soft Read
Errors: 0
Bus 0 Enclosure 0 Disk 2 Soft Read
Errors: 0
```

```
Bus 0 Enclosure 0 Disk 3 Soft Read
Errors: 0
Bus 0 Enclosure 0 Disk 4 Soft Read
Errors: 0
Bus 0 Enclosure 0 Disk 0 Soft Write
Errors: 0
Bus 0 Enclosure 0 Disk 1 Soft Write
Errors: 0
Bus 0 Enclosure 0 Disk 2 Soft Write
Errors: 0
Bus 0 Enclosure 0 Disk 3 Soft Write
Errors: 0
Bus 0 Enclosure 0 Disk 4 Soft Write
Errors: 0
Bus 0 Enclosure 0 Disk 0 Enabled
Bus 0 Enclosure 0 Disk 1 Enabled
Bus 0 Enclosure 0 Disk 2 Enabled
Bus 0 Enclosure 0 Disk 3 Enabled
Bus 0 Enclosure 0 Disk 4 Enabled
Is Private:             NO
Snapshots List:         Not Available
MirrorView Name if any: Not Available
```

`getall -lun` command lists only thin LUN information and does not display the private internal LUNs information in user mode.

```
C:\Program Files\EMC\Navisphere CLI>naviseccli -h 10.14.5.112
-user a -password
a -scope 0 getall -lun

Server IP Address: 10.14.5.112
Agent Rev: 6.28.10 (1.40)

All logical Units Information
-----------------------------
Statistics logging is disabled.
Certain fields are not printed if statistics
logging is not enabled.
LOGICAL UNIT NUMBER 6
Prefetch size (blocks) =         0
Prefetch multiplier =            0
Segment size (blocks) =          0
Segment multiplier =             0
Maximum prefetch (blocks) =      0
Prefetch Disable Size (blocks) = 0
Prefetch idle count =            0

Prefetching: NO
Prefetched data retained NO
Read cache configured according to
specified parameters.

Total Hard Errors:    0
Total Soft Errors:    0
Total Queue Length:   0
Name                  Thin LUN 6
Minimum latency reads N/A

RAID Type:            N/A
RAIDGroup ID:         N/A
State:                Bound
Stripe Crossing:      0
Element Size:         0
Current owner:        SP B
Offset:               N/A
Auto-trespass:        DISABLED
Auto-assign:          DISABLED
Write cache:          ENABLED
Read cache:           ENABLED
Idle Threshold:       0
Idle Delay Time:      0
Write Aside Size:     0
Default Owner:        SP B
Rebuild Priority:     ASAP
Verify Priority:      ASAP
Prct Reads Forced Flushed:  0
Prct Writes Forced Flushed: 0
Prct Rebuilt:               100
Prct Bound:                 100
LUN Capacity(Megabytes):    1024
LUN Capacity(Blocks):       2097152
UID:
60:06:01:60:04:60:1E:00:BE:02:63:43:40:06:DD:11
Bus 0 Enclosure 0 Disk 0 Queue Length:      0
Bus 0 Enclosure 0 Disk 1 Queue Length:      0
Bus 0 Enclosure 0 Disk 2 Queue Length:      0
Bus 0 Enclosure 0 Disk 3 Queue Length:      0
```

```
Bus 0 Enclosure 0 Disk 4 Queue Length:      0
Bus 0 Enclosure 0 Disk 0 Hard Read Errors:  0
Bus 0 Enclosure 0 Disk 1 Hard Read Errors:  0
Bus 0 Enclosure 0 Disk 2 Hard Read Errors:  0
Bus 0 Enclosure 0 Disk 3 Hard Read Errors:  0
Bus 0 Enclosure 0 Disk 4 Hard Read Errors:  0
Bus 0 Enclosure 0 Disk 0 Hard Write Errors: 0
Bus 0 Enclosure 0 Disk 1 Hard Write Errors: 0
Bus 0 Enclosure 0 Disk 2 Hard Write Errors: 0
Bus 0 Enclosure 0 Disk 3 Hard Write Errors: 0
Bus 0 Enclosure 0 Disk 4 Hard Write Errors: 0
Bus 0 Enclosure 0 Disk 0 Soft Read Errors:  0
Bus 0 Enclosure 0 Disk 1 Soft Read Errors:  0
Bus 0 Enclosure 0 Disk 2 Soft Read Errors:  0
Bus 0 Enclosure 0 Disk 3 Soft Read Errors:  0
Bus 0 Enclosure 0 Disk 4 Soft Read Errors:  0
Bus 0 Enclosure 0 Disk 0 Soft Write Errors: 0
Bus 0 Enclosure 0 Disk 1 Soft Write Errors: 0
Bus 0 Enclosure 0 Disk 2 Soft Write Errors: 0
Bus 0 Enclosure 0 Disk 3 Soft Write Errors: 0
Bus 0 Enclosure 0 Disk 4 Soft Write Errors: 0
Bus 0 Enclosure 0 Disk 0 Enabled
Bus 0 Enclosure 0 Disk 1 Enabled
Bus 0 Enclosure 0 Disk 2 Enabled
Bus 0 Enclosure 0 Disk 3 Enabled
Bus 0 Enclosure 0 Disk 4 Enabled
Is Private: NO
Snapshots List: Not Available
MirrorView Name if any: Not Available
```

LUN pool information (same as returned by command **reserved -lunpool -list**).

```
Name of the SP:                     SP A
Total Number of LUNs in Pool:       9
Number of Unallocated LUNs in Pool: 4
Unallocated LUNs:                   14, 24, 23, 22
Allocated LUNs:                     16, 17, 18, 20, 21
Total size in GB:                   4.488281
Unallocated size in GB:             1.292969
Used LUN Pool in GB:                0.017639
% Used of LUN Pool:                 0.393005
Chunk size in disk blocks:          128
```

RAID group information (same as returned by command **getrg**.)

```
All RAID Groups Information
---------------------------
RaidGroup ID:    0                    RAID group identification number.
RaidGroup Type:  r5                   RAID type.
RaidGroup State: Explicit_Remove      Valid States are Invalid,
                 Valid_luns           Explicit_Remove, Valid_luns,
                                      Expanding, Defragmenting, Halted,
                                      and Busy.

List of disks:
Bus 0 Enclosure 0 Disk 0
Bus 0 Enclosure 0 Disk 1
Bus 0 Enclosure 0 Disk 7
Bus 0 Enclosure 0 Disk 8
Bus 0 Enclosure 0 Disk 9
Disks used in the RAID group.
List of luns:        0 1 2 3          LUNs currently in RAID group.
Max Number of disks: 16               Max disks allowed in RAID group.
Max Number of luns:  32               Max LUNs allowed in system.
Raw Capacity (Blocks): 343391320      Raw capacity in disk blocks.
Logical Capacity (Blocks): 274713056  Logical capacity in blocks.
Free Capacity                         Free (unbound and non-contiguous)
(Blocks,non-contiguous): 266324448    capacity of RAID group in blocks.

Free contiguous group of unbound      Displays free contiguous group of
segments: 266324448                   unbound segments in blocks.

Defrag/Expand priority: Medium        May be High, Medium, or Low.
Percent defragmented: 100             Percent complete of defragmenting.
Percent expanded: 100                 Displays if LUN expansion enabled
                                      for this RAID group.
Disk expanding onto: N/A              Displays disks expanding onto or
                                      N/A for not expanding.
Defrag/Expand priority: Medium        May be High, Medium, or Low.
Percent defragmented: 100             Percent defragmented.
Lun Expansion enabled: NO             Whether LUN expansion is enabled
                                      for this RAID group.
Legal RAID types: r5                  Displays legal RAID types for LUNs
                                      to be bound on the RAID group.
```

Storage group information (similar to that returned by **`storagegroup -list`**).

```
Storage Group Name:     Group1                    User defined storage
                                                  group name
Storage Group UID:                                32- byte unique
28:D0:64:D0:BF:90:D5:11:80:1D:08:00:1B:41:07:5B   identification number.

HBA/SP Pairs:                                     HBA UID, SP, and SP
                                                  Port of storage group

HBA UID                                           SP Name SPPort

-------                                           ------- ------
20:00:00:00:C9:20:E2:1C:10:00:00:00:C9:20:E2:1C SP B     1


HLU/ALU Pairs:                                    Host LUN number
                                                  (HLU) and actual LUN
                                                  number (ALU).

HLU Number                ALU Number
----------                ----------
0                          11
1                          12
2                          4

Shareable:                 NO                     YES or NO
```

SnapView information from **-snapviews** switch (same as returned by commands **snapview -listsnapableluns**, **-listsessions**, and **-listsnapshots**).

```
Snapviews Information
---------------------
*** List of LUNs that can be snapped***

Name                          LUN n               List of LUN numbers
                                                  for every LUN that
                                                  can be a source LUN

Name of the session:          sess4_5             Session name

Number of read requests serviced by the           Number
Reserved LUN Pool:

Total number of read requests on the snapview     Number
logical unit:

Number of reads from the TLU:                     Number

Number of write requests in the session:          Number

Number of write requests to Reserved LUN Pool     Number
that triggered a COW:

Total number of writes requests on the            Number
snapview target logical unit:

Number of write requests larger than the chunk    Number
size:

List of Target Logical Units: LUN 4 LUN 5         LUN numbers

snap Logical Units Name:                          LUN name

snap Logical Units UID:                           32-byte unique ID

Session in simulation:                            YES, NO, or Not
                                                  Supported

Session in persistance:                           YES or NO

Session creation time:                            Date and Time

The following items display for every snapshot,   active or inactive

*** Info of SnapView Snapshots ***

SnapView logical unit name: snap4                 LUN name

SnapView logical unit ID:                         32-byte unique ID
60:06:01:60:16:64:08:00:10:54:78:F7:7B:E4:D7:1
1

Target Logical Unit: 4                            LUN ID (same for
                                                  source and snapshot)

State:                                            Current state; for
                                                  example, Active

*** Info of Reserved SnapView Sessions and Snapshots ***

Session Name: SANCopy_isc2to12                    Session name assigned
```

```
                                                    at session start

Target Logical Unit: 2                              LUN ID (same for
                                                    source and snapshot)

SnapView logical unit name: SANCopy_isc2to12        LUN name
```

getarrayuid

Gets the system unique ID

PREREQUISITES

For **naviseccli**, you must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **naviseccli getarrayuid** command displays the unique ID (UID) of the system that contains the current SP. For a Fibre Channel system this is the system WWN. For an iSCSI system this is also the WWN, but iSCSI also has a target name, the `iqn` identifier, which is a unique identifier. A system with an iSCSI and Fibre Channel combination controller shows both types of IDs.

The SP, HBA, and switch ports also have unique IDs. If you specify one or more SPs, then the CLI displays the unique ID of the systems containing those SPs. Knowing the UID of an SP's system is useful with MirrorView mirroring commands and for other operations.

SYNTAX

getarrayuid [**-iscsi**|**-all**] [*sphostnames*]

OPTIONS

sphostnames

Are the hostnames of one or more SPs, separated by spaces or commas. If you omit *sphostnames*, then the CLI displays the UID of the SP specified with the **-h** switch.

-iscsi

Returns the iSCSI target name (`iqn`) for the system on a combo system.

-all

Returns both the system WWN and the iSCSI target name (`iqn`).

Note: If you do not specify any switches, **getarrayuid** returns the system WWN on a system with an iSCSI and Fibre Channel combination controller, as well as on an iSCSI-only system.

EXAMPLE

```
naviseccli -h ss1_spa getarrayuid -all
```

```
Host name  Array UID
Cps42199   50:06:01:60:77:02:C7:A7
1.2.3.4    iqn. 1992-04.com.emc:cx.hk192200422
```

OUTPUT

The UID of the system that holds the SP (see above).

getcache

Gets cache environment information

PREREQUISITES

For **naviseccli**, you must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **naviseccli getcache** command returns information about the SP's caching environment.

An SP's read cache is automatically enabled on powerup if its size is valid. The write cache is automatically enabled on powerup if the cache size is valid and the system has the following components:

- Two SPs
- A fully charged standby power supply (SPS)
- Disk modules in 0_0_0 through 0_0_4. This refers to drives 0–4 in enclosure zero (0) on backend bus zero (0).

Caching statistics are meaningful only if the SP's write cache is enabled.

SYNTAX

```
getcache [-asys] [-bsys] [-bbutd] [-bbutt] [-hacv] [-high] [-low] [-mirror]
[-page] [-pdp] [-ppo] [-rm3a] [-rm3b] [-rsta]
[-rstb] [-rsza] [-rszb] [-spa] [-spb] [-state] [-ucp] [-wst] [-wsz]
```

OPTIONS

-asys

Returns the size of SP A's memory buffer (system buffer space, excludes cache).

-bsys

Returns the size of SP B's memory buffer.

-bbutd

Returns the day of the week to perform the standby power supply (SPS) self-test.

-bbutt

Returns the time of the day to perform the SPS self-test.

-hacv (CX3 series, CX series systems, and dual-SP AX4-5 series running Unisphere only)

Checks whether the HA cache vault is enabled or disabled. HA cache vault determines the availability of system write caching when a single drive in the cache vault fails. When the HA cache vault is enabled, write caching is disabled if a single vault disk fails. When disabled, write caching is not disabled if a single disk fails.

-high

Returns the write cache high watermark. The high watermark is the percentage of dirty pages, which, when reached, causes the SP to begin flushing the cache.

-low

Returns the write cache low watermark. The low watermark is the percentage of cache dirty pages that determines when cache flushing stops. When the write cache low watermark is reached during a flush operation, the SP stops flushing the cache.

-mirror

Returns the write cache mirrored status. Always enabled for fibre.

-page

Returns the size, in KB, of a cache page. This size can be 2, 4, 8, or 16 KB. The default size is 2 KB.

-pdp

Returns the percentage of dirty pages currently in cache, that is, pages that have been modified in the SP's write cache, but that have not yet been written to disk. A high percentage of dirty pages means the cache is handling many write requests.

-ppo

Returns the percentage of pages owned by the SP.

-rm3a

Returns the amount of memory, in MB, reserved for the optimized RAID 3 data buffers on SP A.

-rm3b

Returns the amount of memory, in MB, reserved for the optimized RAID 3 data buffers on SP B.

-rsta

Returns the current internal state of the read cache on SP A.

-rstb

Returns the current internal state of the read cache on SP B.

-rsza

Returns, in MB, the amount of read cache memory SP A is allowed to use.

-rszb

Returns, in MB, the amount of read cache memory SP B is allowed to use.

-spa

Returns the total number of pages in SP A, each page with the cache page size you selected when setting up system caching. This number equals the cache size divided by the cache page size, minus space for checksum tables. If the system has two SPs and both are working, they divide the total number of pages between them. If an SP is idle for a long period or fails, the active SP may increase its share of pages.

-spb

Returns the total number of pages in SP B, each page with the cache page size you selected when setting up system caching. This number equals the cache size divided by the cache page size, minus space for checksum tables. If the system has two SPs and both are working, they divide the total number of pages between them. If an SP is idle for a long period or fails, the active SP may increase its share of pages.

-state

Returns the current state of the SP's read or write cache. The possible read cache states are Enabled, Disabling, and Disabled. An SP's read cache is automatically enabled on powerup if the cache size is a valid number and the SP has at least 8 MB of memory. The possible write cache states are Enabled or Disabled, and several transition states, such as Initializing, Enabling, Disabling, Dumping, and Frozen.

-ucp

Returns the number of unassigned cache pages (owned by neither A nor B).

-wst

Returns the current internal state of the system's write cache.

-wsz

Returns the write cache size for the systems (which are always equal).

EXAMPLE

```
naviseccli -h ss1_spa getcache
```

OUTPUT

The following is a sample output. Actual output varies depending on the switches you use with the **getcache** command.

```
SP Read Cache State                 Enabled
SPA Write Cache State               Disabled
SPB Write Cache State               Disabled
Cache Page size:                    2
Write Cache Mirrored:               YES
Low Watermark:                      60
High Watermark:                     90
SPA Cache pages:                    0
SPB Cache pages:                    0
Unassigned Cache Pages:             0
Read Hit Ratio:                     0
Write Hit Ratio:                    0
Prct Dirty Cache Pages =            0
Prct Cache Pages Owned =            0
SPA Read Cache State                Enabled
SPB Read Cache State                Enabled
SP Write Cache State                Disabled
SPS Test Day:                       Friday
SPS Test Time:                      14:00
SP A Physical Memory                128
SP B Physical Memory                128
SP A Free Memory                    72
SP B Free Memory                    72
SPA Read Cache Size =               62
SPB Read Cache Size =               64
SPA Write Cache Size =              0
SPB Write Cache Size =              0
SPA Optimized Raid 3 Memory Size = 12
SPB Optimized Raid 3 Memory Size = 12
HA Cache Vault:                     Not Available
```

getconfig

Returns system type configuration information

PREREQUISITES

For **naviseccli**, you must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **naviseccli getconfig**command displays system type configuration information. If you omit switches, it displays all configuration type information. You can set configuration information with **setconfig**.

Use the **getsp** command to display SP revision and signature information.

SYNTAX

getconfig [**-ptype**] [**-que**] [**-rer**] [**-tn**] [**-pg8**] [**-rep**]

OPTIONS

-ptype

Displays the system package type.

-que

Displays the setting on how queue full status is handled. `Yes` means that the FLARE software will return device status to the operating system as busy, instead of queue full, when the device queue is full.

-rer

Displays the number of recovered errors.

-tn

Displays the state of the Target Negotiate bit.

-pg8

Displays SCSI mode page 8 information.

-rep

Displays periodic error report information: the number of reported errors or N/A.

EXAMPLE

```
naviseccli -h ss1_spa  getconfig


Sub-System Package Type: 20
Queue Full Status:       DISABLED
Recovered Errors:        DISABLED
Target Negotiate:        Unknown
Mode Page 8:             DISABLED
Periodic Error Report:   N/A
```

getcontrol

Gets SP performance information

PREREQUISITES

For **naviseccli**, you must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **naviseccli getcontrol** command returns information about the SP performance.

SYNTAX

getcontrol [**-allib**] [**-arv**] [**-busy**] [**-cbt**] [**-date**] [**-day**] [**-flush**] [**-idle**] [**-read**] [**-rw**] [**-sc**] [**-sf**] [**-sl**] [**-time**] [**-write**] [**-all**]

OPTIONS

-allib

Returns the idle and busy ticks for all buses.

-arv

Returns the number of times a user request arrived while at least one other request was being processed.

-busy

Returns the percentage of time the SP is busy.

-cbt

Returns the controller idle and busy ticks.

-date

Returns the SP's system date.

-day

Returns the SP's system day.

-flush

Returns the number of times that flushing was turned on by the high watermark, the low watermark, and the Idle unit. This also returns the number of requests to flush the write cache, and the number of write cache blocks flushed.

-idle

Returns the percentage of time the SP is idle.

-read

Returns the number of reads received by the SP.

-rw

Returns the following:

Host read requests	The number of read requests made by the host to the LUN
Host write requests	The number of write requests made by the host to the LUN
Host blocks read	The number of blocks the host read from the LUN
Host blocks written	The number of blocks written from the host to the LUN

-sc

Returns the status of the system cache (on/off).

-sf

Returns the status of the system fault LED (on/off).

-sl

Returns the status of statistics logging (on/off).

-time

Returns the SP's system time.

-write

Returns the number of writes received by the SP.

-all

In addition to the **getcontrol** command information, it displays the serial number for SP.

EXAMPLE

```
naviseccli -h ss1_spa getcontrol
```

OUTPUT

The following is a sample output. Actual output varies depending upon which switches you use with the **getcontrol** command.

```
System Fault LED:              ON
Statistics Logging:            OFF
SP Read Cache State            Disabled
SP Write Cache State           Disabled
Max Requests:                  N/A
Average Requests:              N/A
Hard errors:                   N/A
Total Reads:                   0
Total Writes:                  0
Prct Busy:                     Not Available
Prct Idle:                     Not Available
System Date:                   05/22/2008
Day of the week:               Thursday
System Time:                   11:31:29
Read_requests:                 0
Write_requests:                0
Blocks_read:                   0
Blocks_written:                0
Sum_queue_lengths_by_arrivals:0
Arrivals_to_non_zero_queue:    0
Hw_flush_on:                   0
Idle_flush_on:                 0
Lw_flush_off:                  0
Write_cache_flushes:           0
Write_cache_blocks_flushed:    0
Internal bus 1 busy ticks:     N/A
Internal bus 1 idle ticks:     N/A
Internal bus 2 busy ticks:     N/A
Internal bus 2 idle ticks:     N/A
Internal bus 3 busy ticks:     N/A
Internal bus 3 idle ticks:     N/A
Internal bus 4 busy ticks:     N/A
Internal bus 4 idle ticks:     N/A
Internal bus 5 busy ticks:     N/A
Internal bus 5 idle ticks:     N/A
Controller busy ticks:         0
Controller idle ticks:         0
```

getcrus

Gets CRU state information

PREREQUISITES

For **naviseccli**, you must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **naviseccli getcrus** command returns state information on all or selected CRUs (customer replaceable units) in the system except for disks (see the **getdisk** command) and selected FRUs/sub FRUs in the system. The **getcrus** command displays the state of the following CRUs: fans, link controller cards (LCCs), storage processors (SPs), battery backup units (referred to as standby power supplies or SPSs), and power supplies (PSs or VSCs). You can use **getcrus** without any switches to get the state information for every CRU (except disks). The **getcrus** command displays the state of management module of FRUs and state of I/O module, CPU module, and DIMM of sub FRUs.

Note: If one of the LCCs is pulled from Bus *x*, Enclosure *x*, all data along that bus (after the LCC was pulled) appears as faulted since the agent cannot gather any information along that path. If this occurs, issue the **getcrus** command to the peer SP. The CLI lists the faulted components.

Note: The command switches **-cpua**, **-cpub**, **-dimma**, **-dimmb**, **-ioa**, **-iob**, **-mgmta**, and **-mgmtb** are supported only on Secure CLI.

SYNTAX

```
getcrus [-cablingspsa] [-cablingspsb] [-cachecard] [-cpua] [-cpub] [-dimma]
[-dimmb] [-encdrivetype] [-fana] [-fanb] [-fanc] [-fand] [-fane]
[-fanf] [-fang] [-iocarriera] [-iocarrierb] [-ioa] [-iob] [-lcca]
[-lccb] [-lccreva] [-lccrevb] [-lccsna] [-lccsnb] [-mgmta] [-mgmtb]
[-spa] [-spb] [-spsa] [-spsb] [-speeds] [-vsca] [-vscb] [-vscc] [-vscd]
[-all]
```

OPTIONS

-cablingspsa

Returns the cabling status for SPS A (standby power supply A).

-cablingspsb

Returns the cabling status for SPS B (standby power supply B).

-cachecard (AX series only)

Returns the hardware state information of the cache memory card.

The following table lists the possible hardware states. See also the **luncache** command.

Hardware state	Meaning
OK	The power on the main SP is on and the cache memory card battery is fully charged. The cache memory card is in normal operation.
Not present	The cache memory card is not present.
Faulted	The cache memory card has hardware faults.
Battery charging	The power on the main SP is on and the battery is charging on the cache memory card.
In wrong array	The cache memory card is from the wrong system.

-cpua

Returns the state of the CPU module on SP A.

-cpub

Returns the state of the CPU module on SP B.

-dimma

Returns the state of the DIMM module on SP A.

-dimmb

Returns the state of the DIMM module on SP B.

-encdrivetype

Displays the type(s) of drives that are currently allowed to run in the enclosure.

-fana

Returns the state information for fan A.

-fanb

Returns the state information for fan B.

-fanc (Not supported on AX4-5 series)

Returns the state information for fan C.

-fand (Not supported on AX4-5 series)

Returns the state information for fan D.

-fane (Not supported on AX4-5 series)

Returns the state information for fan E.

-fanf (Not supported on AX4-5 series)

Returns the state information for fan F.

-fang (Not supported on AX4-5 series)

Returns the state information for fan G.

-iocarriera (CX4 series only)

Displays information for the I/O carrier device associated with SP A.

-iocarrierb (CX4 series only)

Displays information for the I/O carrier device associated with SP B.

-ioa

Returns the state of the I/O modules on SP A.

-iob

Returns the state of the I/O modules on SP B.

-lcca

Returns the state information of the LCC for SP A.

-lccb

Returns the state information of the LCC for SP B.

-lccreva|-lccrevb

Returns the revision of the DPE LCC A, LCC B, or both if you specify both switches.

-lccsna|-lccsnb

Returns the serial number of the DPE LCC A, LCC B, or both if you specify both switches.

-mgmta (supported only on Hammerheads)

Returns the state of management module A.

-mgmtb (supported only on Hammerheads)

Returns the state of management module B.

-spa

Returns the current operational state of SP A. It can be in any of the following states:

Present	The SP is the communication channel you are using to communicate with the chassis.
Empty	Agent cannot talk to the SP because a communication channel specifying the SP is not in the agent's configuration file for the selected host. For example, the SP is connected to a different host than the SP in the communications channel for the chassis.
Not Present	SP that is in the communication channel to the selected chassis has failed or been removed.
Removed	SP was not present when the agent was started.

-spb

Returns the state information for SP B. See **-spa** description (above).

-spsa

Returns the state information for SPS (standby power supply, backup battery) A.

-spsb

Returns the state information for standby power supply B.

-speeds

Displays the current and maximum speed of enclosures and LCCs within the enclosures. The current speed indicates the speed an enclosure or LCC is currently running at; the maximum speed indicates the highest speed an enclosure or LCC is capable of running at.

-vsca

Returns the state information on power supply A (A0 for CX3 model 10 systems, CX3 model 20 systems, CX3 model 40 systems).

-vscb

Returns the state information for power supply B (A1 for CX3 model 10 systems, CX3 model 20 systems, CX3 model 40 systems).

-vscc (Not supported on AX4-5 series)

Returns the state information for power supply C (B0 for CX3 model 10 systems, CX3 model 20 systems, CX3 model 40 systems).

-vscd (Not supported on AX4-5 series)

Returns the state information for power supply D (B1 for CX3 model 10 systems, CX3 model 20 systems, CX3 model 40 systems).

-all

Displays the state of all devices.

EXAMPLE # 1

This command gets the information about CRU state.

```
naviseccli -h ss1_spa getcrus
```

EXAMPLE # 2

This command displays the enclosure type.

```
naviseccli -h ss1_spa getcrus –encdrivetype


DPE7 Enclosure 0
Enclosure Drive Type: SAS

DAE5S Bus 0 Enclosure 1
Enclosure Drive Type: SAS

DAE6S Bus 0 Enclosure 2
Enclosure Drive Type: SATA
```

OUTPUT

The following example shows the output from the **getcrus -all** command for the VNX5100/VNX5300 Block/VNX5500 Block systems.

```
naviseccli -h ss1_spa getcrus -all
SPE5 Enclosure SPE
Enclosure Drive Type: N/A
Current Speed: N/A
Maximum Speed: N/A
SP A State:                 Present
SP B State:                 Present
Enclosure SPE Power A0 State: Present
Enclosure SPE Power A1 State: Present
Enclosure SPE Power B0 State: Present
Enclosure SPE Power B1 State: Present
Enclosure SPE SPS A State:  Present
Enclosure SPE SPS B State:  Present
Enclosure SPE SPS A Cabling State: Valid
Enclosure SPE SPS B Cabling State: Valid
Enclosure SPE CPU Module A State: Present
Enclosure SPE CPU Module B State: Present
Enclosure SPE SP A I/O Module 0 State: Present
Enclosure SPE SP A I/O Module 1 State: Empty
Enclosure SPE SP A I/O Module 2 State: Empty
Enclosure SPE SP A I/O Module 3 State: Present
Enclosure SPE SP A I/O Module 4 State: Empty
Enclosure SPE SP B I/O Module 0 State: Present
Enclosure SPE SP B I/O Module 1 State: Empty
Enclosure SPE SP B I/O Module 2 State: Empty
Enclosure SPE SP B I/O Module 3 State: Present
Enclosure SPE SP B I/O Module 4 State: Empty
Enclosure SPE DIMM Module A State: Present
Enclosure SPE DIMM Module B State: Present
Enclosure SPE Management Module A State: Present
Enclosure SPE Management Module B State: Present
```

```
DAE6S Bus 0 Enclosure 0
Enclosure Drive Type: SAS
Current Speed: 6Gbps
Maximum Speed: 6Gbps
Bus 0 Enclosure 0 Power A State: Present
Bus 0 Enclosure 0 Power B State: Present
Bus 0 Enclosure 0 LCC A State: Present
Bus 0 Enclosure 0 LCC B State: Present
Bus 0 Enclosure 0 LCC A Revision: 1.20
Bus 0 Enclosure 0 LCC B Revision: 1.20
Bus 0 Enclosure 0 LCC A Serial #: US1V2101030042
Bus 0 Enclosure 0 LCC B Serial #: US1V2101030045
Bus 0 Enclosure 0 LCC A Current Speed: 6Gbps
Bus 0 Enclosure 0 LCC B Current Speed: 6Gbps
Bus 0 Enclosure 0 LCC A Maximum Speed: 6Gbps
Bus 0 Enclosure 0 LCC B Maximum Speed: 6Gbps

DAE7S Bus 0 Enclosure 1
Enclosure Drive Type: SATA, SAS
Current Speed: 6Gbps
Maximum Speed: 6Gbps
Bus 0 Enclosure 1 Fan 0 State: Present
Bus 0 Enclosure 1 Fan 1 State: Present
Bus 0 Enclosure 1 Fan 2 State: Present
Bus 0 Enclosure 1 Power A State: Faulted
Bus 0 Enclosure 1 Power B State: Present
Bus 0 Enclosure 1 LCC A State: Present
Bus 0 Enclosure 1 LCC B State: Present
Bus 0 Enclosure 1 LCC A Revision: 0.13
Bus 0 Enclosure 1 LCC B Revision: 0.13
Bus 0 Enclosure 1 LCC A Serial #: JWXVL103200530
Bus 0 Enclosure 1 LCC B Serial #: JWXVL103200559
Bus 0 Enclosure 1 LCC A Current Speed: 6Gbps
Bus 0 Enclosure 1 LCC B Current Speed: 6Gbps
Bus 0 Enclosure 1 LCC A Maximum Speed: 6Gbps
Bus 0 Enclosure 1 LCC B Maximum Speed: 6Gbps
Bus 0 Enclosure 1 ICM A State: Present
Bus 0 Enclosure 1 ICM B State: Present
Bus 0 Enclosure 1 ICM A Revision: 255.255
Bus 0 Enclosure 1 ICM B Revision: 255.255
Bus 0 Enclosure 1 ICM A Serial #: JWXCM103100389
Bus 0 Enclosure 1 ICM B Serial #: JWXCM103100245
Bus 0 Enclosure 1 ICM A Current Speed: 6Gbps
Bus 0 Enclosure 1 ICM B Current Speed: 6Gbps
Bus 0 Enclosure 1 ICM A Maximum Speed: 6Gbps
Bus 0 Enclosure 1 ICM B Maximum Speed: 6Gbps
```

The following example shows the output from **getcrus -ioa** command.

```
DPE7 Bus 0 Enclosure 0
Bus 0 Enclosure 0 SP A I/O Module 0 State: Present
Bus 0 Enclosure 0 SP A I/O Module 1 State: Present
```

The following output shows the output for **getcrus -iob** command.

```
DPE7 Bus 0 Enclosure 0
Bus 0 Enclosure 0 SP B I/O Module 0 State: Present
Bus 0 Enclosure 0 SP B I/O Module 1 State: Present
```

The following example shows the output from the **getcrus -all** command for the VNX5700 Block/VNX7500 Block systems.

```
SPE5 Enclosure SPE
Enclosure Drive Type: N/A
Current Speed: N/A
Maximum Speed: N/A
SP A State:                 Present
SP B State:                 Present
Enclosure SPE Power A0 State: Present
Enclosure SPE Power A1 State: Present
Enclosure SPE Power B0 State: Present
Enclosure SPE Power B1 State: Present
Enclosure SPE SPS A State:  Present
Enclosure SPE SPS B State:  Present
Enclosure SPE SPS A Cabling State: Valid
Enclosure SPE SPS B Cabling State: Valid
Enclosure SPE CPU Module A State: Present
Enclosure SPE CPU Module B State: Present
Enclosure SPE SP A I/O Module 0 State: Present
Enclosure SPE SP A I/O Module 1 State: Present
Enclosure SPE SP A I/O Module 2 State: Present
Enclosure SPE SP A I/O Module 3 State: Empty
Enclosure SPE SP A I/O Module 4 State: Present
Enclosure SPE SP B I/O Module 0 State: Present
Enclosure SPE SP B I/O Module 1 State: Present
Enclosure SPE SP B I/O Module 2 State: Present
Enclosure SPE SP B I/O Module 3 State: Empty
Enclosure SPE SP B I/O Module 4 State: Present
Enclosure SPE DIMM Module A State: Present
Enclosure SPE DIMM Module B State: Present
Enclosure SPE Management Module A State: Present
Enclosure SPE Management Module B State: Present
```

getdisk

Gets disk status

PREREQUISITES

For **naviseccli**, you must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **naviseccli getdisk** command returns detailed status information about all or selected disks in the system.

A disk module can be in any of the following operational states:

State	Meaning
Binding	Being bound into a LUN.
Empty	Failed or removed before the agent started running, or the disk wasn't part of a LUN.
Enabled	Either a hot spare on standby or part of a bound LUN that is assigned to (owned by) the SP you are using as the communication channel to the chassis. If the system has another SP, this module's status is Ready when you use the other SP as the communication channel to the chassis.
Equalizing	Data from a hot spare is being copied onto a replacement disk module.
Expanding	Disk is being added to a RAID group.
Failed	Powered down or inaccessible.
Formatting	Being hardware formatted. Generally, modules do not need formatting.
Off	Powered off by the SP, which can happen if a wrong size module is inserted.
Powering Up	Power is being applied to the disk module.
Ready	Module is part of a broken LUN or a LUN that is bound and unassigned. This can mean that the disk module is part of a LUN that is not owned by the SP that you are using as the communication channel to the chassis. If the disk module is part of a LUN assigned to an SP other than the one you are using as the communication channel to the chassis, the module's status is either Enabled or Ready. It is Enabled when you use the other SP as the communication channel to the chassis.
Rebuilding	Module is either a hot spare or replacement disk module that replaced a failed module in a LUN. The data is being rebuilt on a hot spare or a replacement disk module.
Removed	Disk module is removed from the chassis; applies only to a disk module that is part of a LUN.

State	Meaning
Full Power	Drive is in full-power state; no delay occurs with media access.
Low Power	Drive is in low -power state (less than full power); a possible delay can occur with media access.
Reduced Power, Transitioning	Drive is transitioning from a low power/no power to a full power state or vice versa.
Hot Spare Ready	Module is either a hot spare or replacement disk module that replaced a failed module in a LUN. The data is being rebuilt on a hot spare or replacement disk module.
Unbound	Ready to be bound into a LUN.
Unformatted	Disk is unformatted.
Unsupported	Disk is unsupported.

SYNTAX

getdisk [*disk-position*] [**-bind**] [**-bndcrs**] [**-busyticks**] [**-bytrd**] [**-bytwrt**] [**-capacity**] [**-cpn**] [**-drivetype**] [**-hr**] [**-hs**] [**-idleticks**] [**-hw**] [**-lun**] [**-numluns**] [**-powersavingsdiskcapable**] [**-powersavingsdiskslotcapable**] [**-powersavingsstate**] [**-private**] [**-product**] [**-rb**] [**-read**] [**-rds**] [**-rev**] [**-rg**] [**-sectors**] [**-serial**] [**-sig**] [**-speeds**] [**-spinstats**] [**-sr**] [**-state**] [**-sw**] [**-tla**] [**-type**] [**-usercapacity**] [**-vendor**] [**-write**] [**-wrts**] [**-all**]

OPTIONS

disk-position

Returns status for a specific disk. See LUN IDs, unique IDs, and disk IDs on page 39 to verify the format for specifying disks.

When the *disk-position* is not entered, **getdisk** reports on all disks, regardless of which switches are set. To obtain only the information specified by the optional switches, you must include *disk-position* in the **getdisk** command.

-bind

Returns the percentage of the disk that is bound.

-bndcrs

Returns the number of Stripe Boundary Crossings (string value or Unknown).

-busyticks

Returns the amount of time that this disk is busy.

-bytrd

Returns the number of KB read.

-bytwrt

Returns the number of KB written.

-capacity

Returns the disk capacity in MB.

-cpn

Returns the system part number (string value) or N/A.

-drivetype

Returns the drive type of the disk.

-hr

Returns the total number of hard read errors for all the disk modules in the LUN that persisted through all the retries. A growing number of hard errors may mean that one or more of the LUN's disk modules is nearing the end of its useful life.

-hs

Returns hot spare status: NO if not a hot spare, the disk position otherwise; see Table 5 on page 180.

-hw

Returns the total number of hard write errors for all the disk modules in the LUN that persisted through all the retries. A growing number of hard errors may mean that one or more of the LUN's disk modules is nearing the end of its useful life.

-idleticks

Returns the amount of time that this disk is idle.

-lun

Returns the LUN number to which this disk belongs.

-numluns

Returns the number of LUNs bound to this disk. LUNs may span multiple disks.

-powersavingsdiskcapable

Displays whether the vendor has approved the drives for spin down. It states YES or NO.

-powersavingsdiskeligible

Determines if the drive has met the system requirements (slot location) for transitioning to low-power standby state.

-powersavingsstate

Displays the power savings state of the drive.

-private

Returns the offset of every partition on the disk.

-product

Returns the product ID of the disk.

-rb

Returns the percentage of the disk that is rebuilt.

-read

Returns the total number of read requests made to the disk module. You might find the LUN read information in **getlun** more useful because it is for the entire LUN, and not just for one of the disk modules in the LUN.

-rds

Returns the number of read requests.

-rev

Returns the product revision number of the disk.

-rg

Returns the RAID group (if any) associated with this disk.

-sectors

Returns the number of user sectors.

-serial

Returns the serial number of the disk.

-sig

Returns the bind signature, which was automatically assigned during the bind process.

-speeds (CX3 series only)

Displays the current and maximum speed of the disk. The current speed indicates the speed a disk is currently running at; the maximum speed indicates the highest speed a disk is capable of running at. The current speed is dependent on the speed of the enclosure that contains the disk, which is also dependent on the current speed of the bus that the enclosure is running on.

-spinstats

Returns the new disk power savings statistics.

-sr

Returns the total number of soft read errors for all the disk modules in the LUN that disappeared before all the retries. A growing number of soft errors may indicate that one of the LUN's disk modules is nearing the end of its useful life.

-state

Returns the state of the disk.

-sw

Returns the total number of soft write errors for all the disk modules in the LUN that disappeared before all the retries. A growing number of soft errors may indicate that one of the LUN's disk modules is nearing the end of its useful life.

-tla

Returns the TLA part number.

-type

Returns the RAID type of the disk.

-usercapacity

Returns the amount of space on the disk that is assigned to bound LUNs.

-vendor

Returns the vendor ID of the disk.

-write

Returns the total number of write requests to the disk module. You might find the LUN write information in **getlun** more useful because it shows the entire LUN, and not just one disk.

-wrts

Returns the number of write requests.

-all

In addition to the **getdisk** command information, it displays maximum queued requests, average queued requests, percent idle, percent busy information, and power saving attributes.

EXAMPLE

Returns information for disk 1 in disk array enclosure 1 (DAE or DAE2 number 1) on bus 1.

```
naviseccli -h 10.244.211.212 getdisk 0_1_B1
```

OUTPUT

The following is sample output. Actual output varies depending on the switches you use with the **getdisk** command:

```
Bus 0 Enclosure 1  Disk B1
Vendor Id:                HITACHI
Product Id:               HUC10606 CLAR600
Product Revision:         C202
Lun:                      16377
Type:                     16377: Hot Spare
State:                    Hot Spare Ready
Hot Spare:                16377: YES
Hot Spare Replacing:      Inactive
Prct Rebuilt:             16377: 100
Prct Enabled:               16377: 100
Serial Number:            PPG9RTPB
Sectors:                  1125185536 (549407)
Capacity:                 549691
Private:                  16377: 65536
Bind Signature:           0x28289, 1, 13
Hard Read Errors:         0
Hard Write Errors:        0
Soft Read Errors:         0
Soft Write Errors:        0
Read Retries:     N/A
Write Retries:    N/A
Remapped Sectors:         N/A
Number of Reads:          0
Number of Writes:         0
Number of Luns:           1
Raid Group ID:            3
Clariion Part Number:     DG118xxxxx3
Request Service Time:     N/A
Read Requests:            0
Write Requests:           0
Kbytes Read:              0
Kbytes Written:           0
Stripe Enabledary Crossing: 0
Drive Type:               SAS
Clariion TLA Part Number:005000000
User Capacity:            536.530273
Idle Ticks:               0
Busy Ticks:               0
Current Speed: 6Gbps
Maximum Speed: 6Gbps
```

```
naviseccli -h ss1_spa getdisk -drivetype -state
Bus 0 Enclosure 0  Disk 0
Drive Type:             SAS
State:                  Unbound

Bus 0 Enclosure 0  Disk 1
Drive Type:             SAS
State:                  Unbound

Bus 0 Enclosure 0  Disk 2
Drive Type:             SAS
State:                  Unbound

Bus 0 Enclosure 0  Disk 3
Drive Type:             SAS
State:                  Unbound

Bus 0 Enclosure 0  Disk 4
Drive Type:             SAS
State:                  Enabled

Bus 0 Enclosure 0  Disk 5
Drive Type:             SAS
State:                  Enabled

Bus 0 Enclosure 0  Disk 6
Drive Type:             SAS
State:                  Enabled

Bus 0 Enclosure 0  Disk 7
Drive Type:             SAS
State:                  Enabled

Bus 0 Enclosure 0  Disk 8
Drive Type:             SAS
State:                  Enabled

Bus 0 Enclosure 0  Disk 9
Drive Type:             SAS
State:                  Unbound

Bus 0 Enclosure 0  Disk 10
Drive Type:             SAS
State:                  Unbound

Bus 0 Enclosure 0  Disk 11
Drive Type:             SAS
State:                  Unbound

Bus 0 Enclosure 0  Disk 12
Drive Type:             SAS
State:                  Unbound

Bus 0 Enclosure 0  Disk 13
Drive Type:             SAS
State:                  Unbound

Bus 0 Enclosure 0  Disk 14
Drive Type:             SAS
State:                  Unbound

Bus 0 Enclosure 1  Disk A0
```

```
Drive Type:              SATA
State:                   Hot Spare Ready

Bus 0 Enclosure 1  Disk A1
Drive Type:              SATA
State:                   Unbound

Bus 0 Enclosure 1  Disk A2
Drive Type:              SATA
State:                   Unbound

Bus 0 Enclosure 1  Disk A3
Drive Type:              SATA
State:                   Enabled

Bus 0 Enclosure 1  Disk A4
Drive Type:              SATA
State:                   Enabled

Bus 0 Enclosure 1  Disk A5
Drive Type:              SATA
State:                   Enabled

Bus 0 Enclosure 1  Disk A6
State:                   Empty

Bus 0 Enclosure 1  Disk A7
State:                   Empty

Bus 0 Enclosure 1  Disk A8
State:                   Empty

Bus 0 Enclosure 1  Disk A9
State:                   Empty

Bus 0 Enclosure 1  Disk A10
State:                   Empty

Bus 0 Enclosure 1  Disk A11
State:                   Empty

Bus 0 Enclosure 1  Disk B0
Drive Type:              SATA
State:                   Enabled

Bus 0 Enclosure 1  Disk B1
Drive Type:              SAS
State:                   Hot Spare Ready

Bus 0 Enclosure 1  Disk B2
Drive Type:              SATA
State:                   Enabled

Bus 0 Enclosure 1  Disk B3
Drive Type:              SATA
State:                   Unbound

Bus 0 Enclosure 1  Disk B4
Drive Type:              SAS
State:                   Unbound

Bus 0 Enclosure 1  Disk B5
```

```
Drive Type:               SATA
State:                    Unbound

Bus 0 Enclosure 1  Disk B6
State:                    Empty

Bus 0 Enclosure 1  Disk B7
State:                    Empty

Bus 0 Enclosure 1  Disk B8
State:                    Empty

Bus 0 Enclosure 1  Disk B9
State:                    Empty

Bus 0 Enclosure 1  Disk B10
State:                    Empty

Bus 0 Enclosure 1  Disk B11
State:                    Empty

Bus 0 Enclosure 1  Disk C0
Drive Type:               SATA
State:                    Unbound

Bus 0 Enclosure 1  Disk C1
Drive Type:               SATA
State:                    Unbound

Bus 0 Enclosure 1  Disk C2
Drive Type:               SATA
State:                    Unbound

Bus 0 Enclosure 1  Disk C3
Drive Type:               SATA
State:                    Enabled

Bus 0 Enclosure 1  Disk C4
Drive Type:               SATA
State:                    Enabled

Bus 0 Enclosure 1  Disk C5
Drive Type:               SATA
State:                    Enabled

Bus 0 Enclosure 1  Disk C6
State:                    Empty

Bus 0 Enclosure 1  Disk C7
State:                    Empty

Bus 0 Enclosure 1  Disk C8
State:                    Empty

Bus 0 Enclosure 1  Disk C9
State:                    Empty

Bus 0 Enclosure 1  Disk C10
State:                    Empty

Bus 0 Enclosure 1  Disk C11
State:                    Empty
```

```
Bus 0 Enclosure 1  Disk D0
Drive Type:              SATA
State:                   Unbound

Bus 0 Enclosure 1  Disk D1
Drive Type:              SATA
State:                   Unbound

Bus 0 Enclosure 1  Disk D2
Drive Type:              SATA
State:                   Enabled

Bus 0 Enclosure 1  Disk D3
Drive Type:              SATA
State:                   Enabled

Bus 0 Enclosure 1  Disk D4
Drive Type:              SATA
State:                   Enabled

Bus 0 Enclosure 1  Disk D5
Drive Type:              SATA
State:                   Enabled

Bus 0 Enclosure 1  Disk D6
State:                   Empty

Bus 0 Enclosure 1  Disk D7
State:                   Empty

Bus 0 Enclosure 1  Disk D8
State:                   Empty

Bus 0 Enclosure 1  Disk D9
State:                   Empty

Bus 0 Enclosure 1  Disk D10
State:                   Empty

Bus 0 Enclosure 1  Disk D11
State:                   Empty

Bus 0 Enclosure 1  Disk E0
Drive Type:              SATA
State:                   Unbound

Bus 0 Enclosure 1  Disk E1
Drive Type:              SATA
State:                   Unbound

Bus 0 Enclosure 1  Disk E2
Drive Type:              SATA
State:                   Unbound

Bus 0 Enclosure 1  Disk E3
Drive Type:              SATA
State:                   Unbound

Bus 0 Enclosure 1  Disk E4
Drive Type:              SATA
State:                   Unbound
```

```
Bus 0 Enclosure 1  Disk E5
Drive Type:              SATA
State:                   Enabled

Bus 0 Enclosure 1  Disk E6
State:                   Empty

Bus 0 Enclosure 1  Disk E7
State:                   Empty

Bus 0 Enclosure 1  Disk E8
State:                   Empty

Bus 0 Enclosure 1  Disk E9
State:                   Empty

Bus 0 Enclosure 1  Disk E10
State:                   Empty

Bus 0 Enclosure 1  Disk E11
State:                   Empty
```

The following is sample output with the power savings information:

```
naviseccli -h ss1_spa getdisk -all
```

```
Bus 2 Enclosure 0    Disk 0
Vendor Id:                SEAGATE
Product Id:               STT34007 CLAR400
Product Revision:         C003
Lun:                      Unbound
Type:                     N/A
State:                    Unbound
Hot Spare:                NO
Prct Rebuilt:             Unbound
Prct Bound:               Unbound
Serial Number:            3RJ0QQPS
Sectors:                  0 (0)
Capacity:                 375600
Private:                  Unbound
Bind Signature:           0x0, 0, 0
Hard Read Errors:         0
Hard Write Errors:        0
Soft Read Errors:         0
Soft Write Errors:        0
Read Retries:             N/A
Write Retries:            N/A
Remapped Sectors:         N/A
Number of Reads:          0
Number of Writes:         0
Number of Luns:           0
Raid Group ID:            This disk does not belong to a RAIDGroup
Part Number:     DG118032576
Request Service Time:     N/A
Read Requests:            0
Write Requests:           0
Kbytes Read:              0
Kbytes Written:           0
Stripe Boundary Crossing: None
Drive Type:               Fibre Channel
TLA Part Number: 005048775
User Capacity:            0
Idle Ticks:               156837
Busy Ticks:               0
Current Speed:            4Gbps
Maximum Speed:            4Gbps
Queue Max:                N/A
Queue Avg:                N/A
Prct Idle:                1
Prct Busy:                0
Hardware Power Savings Qualified: NO
Hardware Power Savings Eligible: NO
Power Savings State: Full Power
Current Power Savings Log Timestamp: 06/24/09 08:47:38
Spinning Ticks:           0
Standby Ticks:            0
Number of Spin Ups:       0
```

getlog

Gets an SP or Event Monitor log

PREREQUISITES

For **naviseccli**, you must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **naviseccli getlog** command returns the entire SP or Event Monitor log (default), the newest entries to the log, or the oldest entries to the log.

Note: Depending on the size of the log, the getlog command may take several minutes to execute.

The command affects only the log of the SP you specify with the **-h** switch in the command.

The **getlog** command requires an active agent.

Note: Before contacting your service provider, go the CX3 series or CX series self-service website.

Note: For a host not attached (through a switch or HBA) to a system, use **getlog -em**.

SYNTAX

getlog [**-em**] [**-h**] [*+n*] [*-n*]

OPTIONS

-em

Displays the Event Monitor log. If you omit this switch, the CLI displays the Event Monitor log.

-h

Displays the **getlog** header.

+n

Displays the oldest *n* entries in the log, with the oldest entry first. If there are fewer than *n* entries, the entire log is displayed. *N* must be greater than 0.

-n

Displays the newest *n* entries in the log, with the oldest entry first. If there are fewer than *n* entries, the entire log is displayed. *N* must be greater than 0.

If a range of entries is not specified, the entire log is displayed with the oldest entry first.

EXAMPLE

```
naviseccli -h ss1_spa getlog -3


04/10/1999 12:43:01 SP B(6e5) (FE Fibre loop
operational)[0x00] 0 0
04/10/1999 12:43:19 SP B(6e4) (FE Fibre loop down)
[0x03] 0 0
04/10/1999 12:43:19 SP B(6e5) (FE Fibre loop
operational)[0x00] 0 0
```

getloop

Gets fibre loop information

PREREQUISITES

For **naviseccli**, you must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **naviseccli getloop** command returns information about the fibre loop.

This command is not valid for IRIX hosts.

Note: This command applies only to Fibre Channel systems.

SYNTAX

getloop [**-clfo**] [**-conn**] [**-dlf**] [**-icl**] [**-ple**] [**-spf**]

OPTIONS

-clfo

Displays whether the command loop has failed over.

-conn

Displays the connection number.

-dlf

Displays the data loop failover status as follows:

```
Does system have data loop fail-over:
  Yes/No
Does system have illegal Cross-Loop: Yes/No
```

-icl

Displays whether there is an illegal cross loop.

-ple

Displays whether private loop is enabled.

-spf

Displays whether this SP can fail over.

EXAMPLE

```
naviseccli -h ss1_spa getloop


Has Data Loop Failed Over: NO
Can This SP Failover:      NO
Private Loop Enabled:      YES
Illegal Cross Loop:        NO
Connection #0: Enclosure 0
Connection #1: Enclosure 1
Connection #2: Enclosure 2
```

getlun

Gets LUN information

PREREQUISITES

For **naviseccli**, you must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **naviseccli getlun** command returns information about a LUN and the customer replaceable units (CRUs) that make up that LUN.

Note:

For CX3 series and CX series systems, values returned for fields noted with an asterisk (*) below may not be correct. Use Unisphere Analyzer for the correct values.

If statistics logging is disabled, some fields are not printed (switches marked with * below). Other switches must be used with the **-disk** switch (switches marked with ** below).

If the target LUN is a metaLUN, We recommend that you use the **metalun -list** command (see metalun -list on page 368) instead of the **getlun** command to return information about the metaLUN. If you use the **getlun** command, only the following fields report data that apply to metaLUNs — Name, Current owner, Default owner, LUN Capacity (Megabytes), LUN Capacity (Blocks), UID, Is Private, Snapshot List, MirrorView Name if any.

If you target the LUNs that make up a metaLUN, all fields apply.

If the target LUN is a pool LUN, we recommend that you use the storagepool -list command (see storagepool -list on page 570) instead of the getlun command to return information about the pool LUN.

SYNTAX

getlun *lun-number* [**-aa**] [**-addroffset**] [**-at**] [**-bind**] [**-bp***] [**-bread****] [**-brwsp ***] [**-busy****] [**-busyticks**] [**-bwrite****] [**-capacity**] [**-crus**] [**-default**] [**-disk**][**-drivetype**] [**-dsa**] [**-fastcache**] [**-element**] [**-ena****] [**-etp***] [**-ff***] [**-hrdscsi**] [**-idle****] [**-idleticks**][**-idt**] [**-ismetalun**] [**-isthinlun**] [**-it**] [**-itp***] [**-lunbusyticksp***] [**-lunidleticksp***] [**-luncache**] [**-mirrorname**] [**-mp**][**-mt**] [**-name**] [**-nanzq***] [**-nminus**] [**-nzrca***] [**-offset**] [**-owner**] [**-parityelements**] [**-pd**] [**-pic**] [**-prb**] [**-prefetch**] [**-prf**] [**-ps**] [**-private**] [**-psm**] [**-que**] [**-rb**] [**-rc**] [**-reads****] [**-readtime**] [**-ret**] [**-rg**] [**-rhist***] [**-rwf**] [**-rwrsp***] [**-sc**] [**-sftscsi**] [**-slst***] [**-slct***] [**-snapshot**] [**-sor***] [**-sqlah***] [**-srcp**] [**-ss**] [**-ssm**] [**-state**] [**-status**]

[-stripe] [-totque] [-type] [-uid] [-upb*] [-usage] [-verify]
[-was] [-wc] [-wch*] [-wcrh] [-wh*] [-whist*] [-writes**] [-writetime]
[-all]

OPTIONS

lun-number

Specifies the logical unit number (LUN) on which to report. If no LUN number is specified, the CLI reports on all LUNs in the system. See LUN IDs, unique IDs, and disk IDs on page 39 for information on identifying LUN numbers.

-aa

Returns the auto-assignment status (enabled/disabled).

-addroffset

Displays the starting LBA (logical block address) of the LUN. This address tells you where a LUN begins within a RAID group.

-at

Returns auto-trespass status (enabled or disabled).

-bind

Returns the percentage of the disk that is bound.

-bp*

Returns the number of blocks prefetched by read cache.

-bread**

Returns the number of blocks read for each CRU.

-brwsp *

Returns the number of host blocks read and written in SP A and SP B.

-busy**

Returns the percentage of time that the disk is busy.

-busyticks

Returns the amount of time that the disks on this LUN are busy.

-bwrite**

Returns the number of blocks written for each CRU.

-capacity

Returns, in MB, the LUN capacity.

-crus

Returns the names and states of disks in this LUN.

-default

Returns the name of the default owner (SP) of the LUN.

-disk

Returns the disk statistics for the disks in the specified *lun-number*. Valid only when statistics logging is enabled.

-drivetype

Returns the drive type of the disks in the LUN.

-dsa

Displays the status of Dual Simultaneous Access (dsa).

-fastcache

Displays the FAST Cache properties of the LUN.

-element

Returns, in blocks, the stripe size. The stripe size is the number of sectors that the system can read or write to a single disk module in the LUN. The default size is 128 sectors. This size was specified when the LUN was bound. Stripe element size does not apply to a RAID 1 LUN, individual unit, or hot spare.

-ena**

Returns the disk status (`enabled/disabled`). Valid only when the **-disk** switch is included in the command.

-etp*

Returns the explicit trespasses in SP A and SP B.

-ff*

Returns the number of times that a write had to flush a page to make room in the cache.

-hrdscsi

Returns the total number of hard errors.

-idle**

Returns the percentage of time that the disks within the LUN are idle.

-idleticks

Returns the amount of time that the disks on this LUN are idle.

-idt

Returns, in 100ms units, the idle delay time for caching. For example, 5 equals 500 ms.

-ismetalun

Returns information about whether the LUN is a metaLUN or not.

-isthinlun

Returns information about whether the LUN is a thin LUN or not.

-it

Returns the idle threshold value for caching; that is, the maximum number of I/Os that can be outstanding to a LUN and still have the LUN be considered idle.

-itp*

Returns the implicit trespasses in SP A and SP B.

-lunbusytickssp*

Returns the amount of time that the disks on this LUN are busy in SP A and SP B.

-lunidletickssp*

Returns the amount of time that the disks on this LUN are idle in SP A and SP B.

-luncache

Returns LUN offline (cache dirty) condition information for the specified LUN. See also the **luncache** command.

-mirrorname

Returns the MirrorView mirror name.

-mp

Returns the absolute maximum number of disk blocks to prefetch in response to a read request for variablelength prefetching.

-name

Returns the LUN name. This switch applies only to systems running a version of FLARE software that supports storage group commands. LUN names are displayed in the UI. You cannot use the LUN name as a CLI command argument.

Note: The **-name** switch applies only to shared systems.

-nanzq*

Returns the number on arrivals with nonzero queue.

-nminus

Returns the status of minimal latency read support (is or is not supported).

-nzrca*

Returns the nonzero request count arrivals in SP A and SP B.

-offset

Returns the alignment offset, assigned when the LUN was bound. Refer to the **bind -offset** switch.

-owner

Returns the name of the SP that currently owns the LUN. If neither SP owns the LUN a value of Unknown is returned.

-parityelements (CX3 series only)

Displays the number of parity elements for a LUN with a RAID type of RAID 6 or RAID 5. This switch is relevant only for LUNs that have a RAID type of RAID 6 or RAID 5. For a LUN with a RAID type other than RAID 6 or RAID 5, the CLI displays an N/A value.

-pd

Returns, in blocks, the prefetch disable size. The prefetch disable size is the size of the smallest read request for which prefetching is disabled.

-pic

Returns the maximum number of I/Os that can be outstanding to the unit and have the unit still perform prefetching.

-prb

Returns the percentage of the LUN that is rebuilt.

-prefetch

Returns the prefetch type that the LUN is using for read caching.

The possible output follows.

```
Variable length prefetching YES
Constant length prefetching YES
Prefetching: NO
```

-prf

Returns the percentage of read requests that caused a flush.

-ps

Returns the number of blocks of data prefetched for one host read request for constant-length prefetching. The prefetch size must be equal to or greater than the segment size. Ranges from 0 to 8192.

-private

Returns information on all private LUNs in the system.

-psm

Returns the variable prefetch size. The variable prefetch size is determined by multiplying the size of the read request, in blocks, by the multiplier. For example, if the prefetch multiplier is set to 4 and the amount of data requested is 2 KB (4 disk blocks), then the variable prefetch size is 4 times 2 KB or 8 KB (16 disk blocks).

-que

Returns the queue length, a number.

-rb

Returns the value for the rebuild priority (`ASAP`, `High` , `Medium` , or `Low`).

-rc

Returns the LUN's read cache state (`enabled` or `disabled`).

Note: The read SP cache is enabled by default while binding LUNs on flash drives. It is enabled for all RAID types, except for a hot spare.

-reads**

Returns the number of reads received for each CRU.

-readtime

Returns the cumulative read time in microseconds.

-ret

Returns the priority for retaining prefetched data when the read cache becomes full. If the value returned is YES, prefetched data has priority over host-requested data. If the value returned is NO, both data types have the same priority.

-rg

Returns the RAID group ID.

-rhist*

Returns Read Histogram information. Read Histogram is an system of 10 locations that contain the number of reads. Element *n* of the system contains the number of reads that were larger than or equal to 2^n-1 and less than 2^n blocks in size. For example, the first bucket contains the number of 1 block reads, the second contains the number of 2-3 block reads, the third contains the number of 4-7 block reads, and so on.**-rhist** also displays read histogram overflows, which are the number of I/O operations that were larger than 512 blocks.

-rwf

Returns the percentage of write requests that caused a cache flush.

-rwrsp*

Returns the number of host read and write requests in SP A and SP B.

-sc

Returns the LUN capacity as stripe count.

-sftscsi

Returns the total number of soft (correctable) errors.

-slst*

Returns the statistics logging start time.

-slct*

Returns the statistics logging current time.

-snapshot

Returns the number of SnapView snapshots (copy images on which a SnapView session is active).

-sor*

Returns the sum of outstanding requests in SP A and SP B.

-sqlah*

Returns the sum of queue lengths on arrivals high.

-srcp

Returns the read cache configuration.

-ss

Returns the prefetch segment size; that is, the size of the segments that make up a constant-length prefetch operation. For constant-length prefetching, **-ss** returns the segment size (in blocks) of data prefetched in one read operation from the LUN.

-ssm

Returns the prefetch segment size/multiplier; that is, the size of the segments that make up a prefetch operation. For variable-length prefetching, **-ssm** returns the multiplier which determines the amount of data, relative to the amount of requested data prefetched in one read operation. For example, if the segment multiplier is 4, the segment size is 4 times the amount of data requested.

-state

Returns the state of the LUN. Valid states are: Expanding, Defragmenting, Faulted, Transitional, or bound.

-status (AX series, CX series, and CX3 series only)

Returns the state of the Device Map for a specified LUN. The Device Map stores the configuration information about all the replication software in the system that is associated with the LUN.

-stripe

Returns the number of times an I/O crossed a stripe boundary on a RAID 6, RAID 5, RAID 0, or RAID 1/0 LUN.

-totque

Returns the total queue length, a number.

-type

Returns the RAID type of the LUN as follows:

```
RAID 0 - nonredundant individual access array
RAID 1 - mirrored pair
RAID 3 - single-disk parity
RAID 5 - distributed parity
RAID 6 - double distributed parity
RAID 1/0 - mirrored RAID 0 group
Disk - individual unit
Hot Spare - hot spare
```

Note: RAID 6 is available only for CX series systems running FLARE 02.26.xxx.5.yyy or later and for CX3 series systems running FLARE 03.26.xxx.5.yyy or later.

-uid

Returns the LUN unique ID.

-upb*

Returns the number of prefetched blocks not used by the read cache.

-usage

Returns the usage for a private LUN. For standard LUNs the usage displays as Unknown.

-verify

Returns the value for the verify priority (ASAP, High, Medium, or Low).

-was

Returns the minimum block size request that bypasses cache.

-wc

Returns the LUN's write cache state (`enabled` or `disabled`).

Note: The write SP cache is enabled by default while binding LUNs on flash drives. It is enabled for all RAID types, except for a hot spare.

-wch*

Returns the number of times that a write was completely satisfied by the cache, avoiding a disk operation.

-wcrh

Returns the number of times that a write request referenced an address location that was previously written and is still dirty in cache, and not yet flushed. Write rehits form a subset of write cache hits since they overwrite already existing data in the write cache.

-wh*

Returns the write hit information, if statistics logging is enabled.

-whist*

Returns write histogram information. Write Histogram is an system of 10 locations that contain the number of writes. Element *n* of the system contains the number of writes that were larger than or equal to 2^n-1 and less than 2^n blocks in size. For example, the first bucket contains the number of 1 block writes, the second contains the number of 2-3 block writes, the third contains the number of 4-7 block writes, and so on. **whist** also displays the write histogram overflows, which are the number of writes that were larger than 512 blocks.

-writes**

Returns the number of writes received for each CRU.

-writetime

Returns the cumulative write time in microseconds.

-all

Lists the **getlun** command information along with the FAST Cache information.

EXAMPLE # 1

This example retrieves the LBA (logical block address), LUN capacity, and alignment offset information.

```
naviseccli -h  ss1_spa getlun -addroffset -offset -capacity
```

```
LOGICAL UNIT NUMBER 0
Offset:                   0
LUN Capacity(Megabytes): 1024
LUN Capacity(Blocks):    2097152
Address Offset:           0

LOGICAL UNIT NUMBER 1
Offset:                   0
LUN Capacity(Megabytes): 5120
LUN Capacity(Blocks):    10485760
Address Offset:           2097152

LOGICAL UNIT NUMBER 2
Offset:                   7530
LUN Capacity(Megabytes): 10240
LUN Capacity(Blocks):    20971520
Address Offset:           12582912
```

EXAMPLE # 2

This example retrieves information about LUN number 13: (See sample listing following)

```
naviseccli -h ss1_spa getlun 13
```

EXAMPLE # 3

This example retrieves the cumulative read time and write time.

```
naviseccli -h ss1_spa getlun 0 -readtime -writetime


Cumulative Read Time (microseconds):          87937
Cumulative Write Time (microseconds):         0
```

OUTPUT

The following is a sample output. Actual output varies depending on the switches you use with the **`getlun`** command.

```
LOGICAL UNIT NUMBER                   13
Prefetch size (blocks) =              0
Prefetch multiplier =                 48
Segment size (blocks) =               0
Segment multiplier =                  4
Maximum prefetch (blocks) =           512
Prefetch Disable Size (blocks) =      \129
Prefetch idle count =                 40
Variable length prefetching           YES
Prefetched data retained              YES
Read cache configured according
to specified parameters.
Name                                  LUN 13
Minimum Latency Reads                 N/A
RAID Type:                            RAID5
RAIDGroup ID:                         0
State:                                Bound
Stripe Crossing:                      0
Element Size:                  128 128
Current owner:                        SP B
Offset:                            0 0
Auto-trespass:                        DISABLED
Auto-assign:                          DISABLED
Write cache:                          ENABLED
Read cache:                           ENABLED
Idle Threshold:                    0 0
Idle Delay Time:                      20
Write Aside Size:                     1023
Default Owner:                        SP B
Rebuild Priority:                     ASAP
Verify Priority:                      Low
rct Reads Forced Flushed:             0
Prct Writes Forced Flushed:           0
Prct Rebuilt:                         100
Prct Bound:                           100
LUN Capacity(Megabytes):              1024
LUN Capacity(Blocks):                 2097152
UID:                                  60:06:01:FD:26:60:00:00:
                                      C9:27:93:85:F6:76:D5:11

Enclosure 0 Disk 0 Queue Length:      0
Enclosure 0 Disk 1 Queue Length:      0
Enclosure 0 Disk 7 Queue Length:      0
Enclosure 0 Disk 8 Queue Length:      0
Enclosure 0 Disk 9 Queue Length:      0
Enclosure 0 Disk 1 Hard Read Errors:  0
Enclosure 0 Disk 7 Hard Read Errors:  0
Enclosure 0 Disk 8 Hard Read Errors:  0
Enclosure 0 Disk 9 Hard Read Errors:  0
Enclosure 0 Disk 0 Hard Write Errors:0
Enclosure 0 Disk 1 Hard Write Errors:0
Enclosure 0 Disk 7 Hard Write Errors:0
Enclosure 0 Disk 8 Hard Write Errors:0
Enclosure 0 Disk 9 Hard Write Errors:0
Enclosure 0 Disk 0 Soft Read Errors:  0
Enclosure 0 Disk 1 Soft Read Errors:  0
Enclosure 0 Disk 7 Soft Read Errors:  0
Enclosure 0 Disk 8 Soft Read Errors:  0
Enclosure 0 Disk 9 Soft Read Errors:  0
Enclosure 0 Disk 0 Soft Write Errors:0
Enclosure 0 Disk 1 Soft Write Errors:0
Enclosure 0 Disk 7 Soft Write Errors:0
```

```
Enclosure 0 Disk 8 Soft Write Errors:0
Enclosure 0 Disk 9 Soft Write Errors:0
Bus 0 Enclosure 0 Disk 0 Enabled
Bus 0 Enclosure 0 Disk 1 Enabled
Bus 0 Enclosure 0 Disk 7 Enabled
Bus 0 Enclosure 0 Disk 8 Enabled
Bus 0 Enclosure 0 Disk 9 Enabled
Is Private:                          NO
Usage:
Mirrored Name if any                 Not Mirrored
```

getresume

Displays resume information for system devices

PREREQUISITES

For **naviseccli**, you must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **naviseccli getresume** command displays the properties (resume information) for system devices, such as the enclosure display board, link control card (LCC), power supply (PS), storage processor (SP), SAN personality card, central processing unit module (CPU), I/O module, management module, and the standby power supply (SPS). You can display resume information for a specific device or for all devices.

The product serial number, product part number, and product revision are displayed only for the SPE enclosure on the CX5 system. This information is displayed only when you use the **-all** switch. Only Secure CLI supports use of this switch.

SYNTAX

```
getresume [-all] [-cpu] [-io] [-iocarrier] [-lcc busNumber enclosureNumber
[lcca|lccb]] [-mgmt mgmta|mgmtb] [-mp] [-pc]
[-ps busNumber enclosureNumber|xpe [psa|psb]] [-sp sp] [-sps]
[-fan]
```

OPTIONS

-all

Displays resume information for all devices.

-cpu (CX3 series only)

Displays resume information for the central processing unit (CPU) modules.

-io (CX3 series and AX4-5 series only)

Displays resume information for the personality card.

-iocarrier (CX4 series only)

Displays resume information for I/O carrier devices on both SPs.

-lcc *busNumber enclosureNumber* **[lcca|lccb]**

Displays resume information for the link control card. If you omit **lcca** or **lccb**, information is returned for link control cards A and B.

-mgmt [mgmta|mgmtb] (CX3 series only)

Displays resume information for the management modules. If you specify **mgmta**, resume information is displayed for the management module associated with SP A; if you specify **mgmtb**, resume information is displayed for the management module associated with SP B.

-mp

Displays resume information for the enclosures.

-pc (Not supported on AX4-5 series)

Displays resume information for the SAN personality card.

-ps *busNumber enclosureNumber|xpe* **[psa|psb]**

Displays resume information for the power supply. If you omit **psa** or **psb**, information is returned for power supplies A and B.

Note: For CX3 model 40 systems, CX3 model 20 systems, and CX3 model 10 systems, resume information is displayed for the power supplies associated with the SP you specify in the command line. If you omit **psa** or **psb** arguments, N/A values are returned for the power supplies that are not associated with the SP you specify.

-sp *sp*

Displays resume information for the specified SP.

Note: For CX3 series and later systems, resume information for both SPs is displayed. If the SP specified in the command line is not functional, the CLI continues to return resume information for both SPs.

-sps

Displays resume information for the standby power supply (SPS) that is associated with the SP you specify in the command line.

-fan

Displays the resume information for the cooling modules.

EXAMPLE

This example displays information stored in the resume PROM for power supplies A and B (bus 0, enclosure 1).

```
naviseccli -h ss1_spa getresume -ps 0 1


Bus 0 Enclosure 1
Power A
EMC Part Number 118032322
EMC Artwork Revision 000
EMC Assembly Revision A03
EMC Serial Number AC115040501930
Vendor Part Number API2SG02-710
Vendor Assembly Number M02
Vendor Serial Number AC1040501930
Vendor Name ACBEL POLYTECH INC.
Location of Manufacture Apex, NC USA
Year of Manufacture 2004
Month of Manufacture 02
Day of Manufacture 13
Assembly Name 12V P/S w/BWR, RPWR
Programmable Name Micro 11.33
Programmable Revision Micro 11.33

Bus 0 Enclosure 1
Power B
EMC Part Number 118032322
EMC Artwork Revision 000
EMC Assembly Revision A03
EMC Serial Number AC115040501699
Vendor Part Number API2SG02-710
Vendor Assembly Number M02
Vendor Serial Number AC1040501699
Vendor Name ACBEL POLYTECH INC.
Location of Manufacture Apex, NC USA
Year of Manufacture 2004
Month of Manufacture 02
Day of Manufacture 13
Assembly Name 12V P/S w/BWR, RPWR
Programmable Name Micro 11.33
Programmable Revision Micro 11.33
```

OUTPUT

The following example shows sample output of resume information for I/O carrier device 0 on both SPs.

```
Storage Processor A
I/O Carrier 0
EMC Part Number             204-012-901D
EMC Artwork Revision        N/A
EMC Assembly Revision       D04
EMC Serial Number           CF2JY063400197
Vendor Part Number          N/A
Vendor Artwork Number       N/A
Vendor Assembly Number      N/A
Vendor Serial Number        N/A
Vendor Name                 CELESTICA
Location of Manufacture     THAILAND
Year of Manufacture         2006
Month of Manufacture        9
Day of Manufacture          15
Assembly Name               IO Carrier Device
Programmable Name           NVRAM0:FLASH0:NVRAM1
Programmable Revision       0.01:2.07:0.01

Storage Processor B
I/O Carrier                 0
EMC Part Number             204-012-901D
EMC Artwork Revision        N/A
EMC Assembly Revision       D04
EMC Serial Number           CF2JY063400174
Vendor Part Number          N/A
Vendor Artwork Number       N/A
Vendor Assembly Number      N/A
Vendor Serial Number        N/A
Vendor Name                 CELESTICA
Location of Manufacture     THAILAND
Year of Manufacture         2006
Month of Manufacture        9
Day of Manufacture          14
Assembly Name               IO Carrier Device
Programmable Name           NVRAM0:FLASH0:NVRAM1
Programmable Revision       0.01:2.07:0.01
```

```
Enclosure SPE

Chassis/Midplane
EMC Part Number: 100-562-266
EMC Artwork Revision: N/A
EMC Assembly Revision: A01
EMC Serial Number: HK100072600036
Vendor Part Number: N/A
Vendor Artwork Number: N/A
Vendor Assembly Number: N/A
Vendor Serial Number: N/A
Vendor Name: N/A
Location of Manufacture: Hopk,MA USA
Year of Manufacture: 2007
Month of Manufacture: 07
Day of Manufacture: 11
Assembly Name: DREADNOUGHT DVT CHASSIS
Programmable Name: Micro 11.33
Programmable Revision: Micro 11.33
EMC Product Serial Number: XXXXXXXXXXXXXX
EMC Product Part Number: 900-XXX-XXX
EMC Product Revision: XX.XX.XX
Bus 0 Enclosure 0

Chassis/Midplane
EMC Part Number: 100-561-622
EMC Artwork Revision: D05
EMC Assembly Revision: A08
EMC Serial Number: FCNST064401287
Vendor Part Number: N/A
Vendor Artwork Number: N/A
Vendor Assembly Number: N/A
Vendor Serial Number: N/A
Vendor Name: FOXCONN, SHENZHEN, CHINA
Location of Manufacture: LONGHUA TOWN, SHENZHEN,CHINA
Year of Manufacture: 2006
Month of Manufacture: 10
Day of Manufacture: 30
Assembly Name: 4GB FC DAE STILETTO W/FLANGES
Programmable Name: Micro 11.33
Programmable Revision: Micro 11.33
Bus 1 Enclosure 0

Chassis/Midplane
EMC Part Number: 100-561-622
EMC Artwork Revision: D05
EMC Assembly Revision: A08
EMC Serial Number: FCJST064500188
Vendor Part Number: N/A
Vendor Artwork Number: N/A
Vendor Assembly Number: N/A
Vendor Serial Number: N/A
Vendor Name: FOXCONN, SHENZHEN, CHINA
Location of Manufacture: LONGHUA TOWN, SHENZHEN, CHINA
Year of Manufacture: 2006
Month of Manufacture: 11
Day of Manufacture: 09
Assembly Name: 4GB FC DAE STILETTO W/FLANGES
Programmable Name: Micro 11.33
Programmable Revision: Micro 11.33
```

The following example shows sample output of the **getresume -fan** command.

```
naviseccli -h ss1_spa getresume -fan
Bus 0 Enclosure 1
Fan 0
EMC Part Number:           303-173-000A
EMC Artwork Revision:      A
EMC Assembly Revision:     A
EMC Serial Number:         JWXFF102900126
Vendor Part Number:        N/A
Vendor Artwork Number:     N/A
Vendor Assembly Number:    N/A
Vendor Serial Number:      N/A
Vendor Name:               Jabil
Location of Manufacture:   Wuxi, Jiangsu province, China
Year of Manufacture:       2010
Month of Manufacture:      08
Day of Manufacture:        10
Assembly Name:             VOYAGER FAN CONTROL MODULE
Programmable Name:         N/A
Programmable Revision:     0.0
```

getrg

Gets RAID group information

PREREQUISITES

For **naviseccli**, you must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **naviseccli getrg** command returns information about the specified RAID group.

If no RAID group is specified, the command returns information about all RAID groups.

SYNTAX

```
getrg rgID [-disks] [-drivetype] [-exdisks] [-hotspare] [-legal] [-lunex]
[-lunlist] [-lusc] [-maxd] [-maxl] [-pod]
[-powersavingssetting] [-powersavingseligible]
[-isrginstandbystate] [-prcntdf] [-prcntex] [-state] [-tcap] [-type]
[-ucap] [-all]
```

OPTIONS

rgID

Is the RAID group identification number. *rgID* specifies a number between 0 and the maximum number of RAID groups supported by the system.

-disks

Returns the state of disks in the RAID group.

-drivetype

Returns information about what drive type the RAID group consists of.

-exdisks

Returns information about which disks are expanding. Displays N/A for not expanding.

-hotspare

Returns the RAID group number that has the faulted disks for which the hot spare is replacing.

-legal

Returns information about specific RAID type LUNs that you can bind for a specific RAID group. How you can bind the new LUNs depends on the number of LUNs that already exist and upon the number of disks in the RAID group.

-lunex

Returns information about which LUNs are expanding. Displays `NO` for not expanding.

-lunlist

Returns a list of LUNs that are currently in the RAID group.

-lusc

Returns a free contiguous group of unbound segments in blocks.

-maxd

Returns the maximum number of disks that are allowed in the RAID group.

-maxl

Returns the maximum number of LUNs that are allowed in the RAID group.

-pod

Returns the priority of defragmention/expansion operations. Valid values are high, medium, low, or N/A.

-powersavingssetting

Sets the power savings setting ON or OFF. The default value for a nonconfigured RAID group is OFF.

-powersavingseligible

Determines the eligibility of a RAID group for the power savings option. A RAID group is eligible for power savings when all the disks in the RAID group are eligible for power savings.

-isrginstandbystate

Returns the power savings state of the RAID group when all the disks participating in RAID group are in power savings mode.

-prcntdf

Returns the percent of defragmention that is complete.

-prcntex

Returns the percent of expansion that is complete.

-state

Returns the RAID group state. Valid states are: Invalid, Explicit_Remove, Valid_luns, Expanding, Defragmenting, Halted, and Busy.

-tcap

Returns the raw and logical capacity of the RAID group in blocks.

-type

Returns the RAID group type.

-ucap

Returns the free (unbounded) capacity of the RAID group in blocks.

-all

Lists the RAID group information.

EXAMPLE

Retrieves information about RAID group 1.

```
naviseccli -h ss1_spa getrg 1
```

OUTPUT

The following is a sample output. The actual output varies depending on the switches you use with the **getrg** command.

```
RAID Group ID: 1
RAID Group Type: r5
RAID Group State: Explicit_Remove
                  Valid_luns
List of disks:     Bus 1 Enclosure 0  Disk 9
                   Bus 1 Enclosure 0  Disk 8
                   Bus 1 Enclosure 0  Disk 7
                   Bus 1 Enclosure 0  Disk 6
                   Bus 1 Enclosure 0  Disk 5

List of luns: 24562 24563 0 24561 24560 1 2 3 4
Max Number of disks: 16
Max Number of luns: 256
Raw Capacity (Blocks): 3845805080
Logical Capacity (Blocks): 3076643968
Free Capacity (Blocks,non-contiguous): 3047283712
Free contiguous group of unbound segments: 3045186560
Defrag/Expand priority: Medium
Percent defragmented: 100
Percent expanded: 100
Disk expanding onto: N/A
Lun Expansion enabled: NO
Legal RAID types: r5
Power Savings Setting: OFF
RAID GROUP Power Savings Eligible: NO
Is RAID GROUP in Power Savings Mode: NO
Drive Type: SATA Flash


RaidGroup ID: 5
RaidGroup Type: r5
RaidGroup State: Explicit_Remove
                 Valid_luns
List of disks: Bus 1 Enclosure 0  Disk 5
               Bus 1 Enclosure 0  Disk 6
               Bus 1 Enclosure 0  Disk 7
               Bus 1 Enclosure 0  Disk 8
               Bus 1 Enclosure 0  Disk 9
List of luns: 50 51 52 53 54
Max Number of disks: 16
Max Number of luns: 256
Raw Capacity (Blocks):3845805080
Logical Capacity (Blocks): 3076643968
Free Capacity (Blocks,non-contiguous): 3047283712
Free contiguous group of unbound segments: 3045186560
Defrag/Expand priority: Medium
Percent defragmented: 100
Percent expanded: 100
Disk expanding onto: N/A
Lun Expansion enabled: NO
Legal RAID types: r5
Power Savings Setting: OFF
RAID GROUP Power Savings Eligible: NO
Is RAID GROUP in Power Savings Mode: NO
Drive Type: NL SAS
```

The following is a sample output of the **`getrg -drivetype`** command.

```
RaidGroup ID: 1
Drive Type: SATA Flash

RaidGroup ID: 5
Drive Type: NL SAS
```

getsniffer

Gets background verify reports

PREREQUISITES

For **naviseccli**, you must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **naviseccli getsniffer** command retrieves background verify reports. You can retrieve reports for a specific LUN, all LUNs in a RAID group, or all LUNs in a system.

Note: The **getsniffer** command does not support thin LUNs.

SYNTAX

getsniffer -all|*lun*|**-rg** *raidgroupnumber* [**-alltot**] [**-curr**] [**-nonv**] [**-rg**] [**-rec**]

OPTIONS

-all

Retrieves reports on all LUNs in the system, owned by the target SP.

Note: When you specify the **-all** switch, it may generate a sizeable amount of data and take a considerable amount of time to generate the data.

lun

Specifies the logical unit on which to report. *lun* specifies the logical unit number.

-rg *raidgroupnumber*

Retrieves reports on all LUNs in the RAID group, owned by the target SP.

-alltot

Retrieves and displays the report of historical totals of all full unit verifies.

-curr

Retrieves and displays the report of the currently running full unit verify.

-nonv

Retrieves and displays the report of historical totals of all non-volatile verifies.

-rec

Retrieves and displays the report of the most recently completed full unit verify.

EXAMPLE

Retrieves the report of the active full unit verify operation for LUN 1.

```
naviseccli -h ss1_spa getsniffer 1
```

OUTPUT

The following is a sample output. Actual output varies depending on the switches you use with the **getsniffer** command.

```
VERIFY RESULTS FOR UNIT 1
Sniffing state:ENABLED
Sniffing rate(100 ms/IO):4
Background verify priority:ASAP
Historical Total of all Non-Volatile Recovery Verifies(0 passes)
-------------------------------------------------------
                   Corrected   Uncorrectable
Checksum errors     0           0
Write Stamp errors  0           0
Time Stamp errors   0           0
Shed Stamp errors   0           0
Coherency errors    0           0

Currently Running Full Unit Verify
-------------------------------------------------------
Verify State: Sniff Running
Percent Complete:0
                   Corrected Uncorrectable
Checksum errors     0         0
Write Stamp errors  0         0
Time Stamp errors   0         0
Shed Stamp errors   0         0
Coherency errors    0         0

Most Recently Completed Full Unit Verify
-------------------------------------------------------
                   Corrected Uncorrectable
Checksum errors     0         0
Write Stamp errors  0         0
Time Stamp errors   0         0
Shed Stamp errors   0         0
Coherency errors    0         0

Historical Total of All Full Unit Verifies(0 passes)
-------------------------------------------------------
                   Corrected Uncorrectable
Checksum errors     0         0
Write Stamp errors  0         0
Time Stamp errors   0         0
Shed Stamp errors   0         0
Coherency errors    0         0
```

getsp

Gets the SP revision and serial number information

PREREQUISITES

For **naviseccli**, you must have a user account on the system on which you want to execute the command.

DESCRIPTION

Displays SP identification information. If you omit switches, it displays all SP configuration information.

Note: Use the **getsp** command to display SP revision and signature information.

SYNTAX

getsp [**-type**] [**-sig**] [**-psig**] [**-rev**] [**-ser**] [**-mem**] [**-id**]

OPTIONS

-type

Displays the SP type.

-sig

Displays the SP unique signature.

-psig

Displays the SP peer unique signature.

-rev

Displays the SP revision number.

-ser

Displays the SP serial number.

-mem

Displays the SP memory size.

-id

Displays the SP SCSI ID if available, otherwise displays N/A.

EXAMPLE # 1

```
naviseccli -h ss1_spa  getsp


SP A

Type of Each SP:           Unknown
Signature For The SP:      147509
Signature For The Peer SP: 135171
Revision Number For The SP:0.00.00
Serial Number For The SP:  N/A
Memory Size For The SP:    930
SP SCSI ID if Available:   0

SP B

Type of Each SP:           Unknown
Signature For The SP:      135171
Signature For The Peer SP: 147509
Revision Number For The SP:1.56.20
Serial Number For The SP:  A1000330
Memory Size For The SP:    930
SP SCSI ID if Available:   0
```

EXAMPLE # 2

The following command displays the enclosure type for VNX5100/VNX5300 Block/VNX5500 Block systems.

```
naviseccli -h ss1_spa getsp -type


SP A
Cabinet: DPE7

SP B
Cabinet: DPE7
```

EXAMPLE # 3

The following command displays the enclosure type for VNX5700 Block/VNX7500 Block systems.

```
naviseccli -h ss1_spa getsp -type


SP A
Cabinet:             SPE5

SP B
Cabinet:             SPE5
```

getsptime

Gets the date and time setting on each SP system clock

PREREQUISITES

For **naviseccli**, you must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **naviseccli** command displays the time on the system clocks in one or both storage processors. The FLARE software ensures that the system clocks in both SPs are close but necessarily identical.

SYNTAX

```
getsptime [-spa|-spb]
```

OPTIONS

-spa or -spb

Specifies from which SP to display the date and time.

EXAMPLE

```
naviseccli -h 10.35.50.11 -user xxxxxx -password xxxxxx -scope 0 getsptime

Time on SP A: 08/25/10 10:09:28
Time on SP B: 08/25/10 10:09:40
```

OUTPUT

The SP date and time.

getunusedluns

Returns the number of LUNs not used by any storage group or by any replication applications

PREREQUISITES

For **naviseccli**, you must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **naviseccli getunusedluns** command displays all the unused LUNs, which are those the storage group and replication applications are not using.

SYNTAX

getunusedluns

EXAMPLE

```
naviseccli -h ss1_spa getunusedluns
```

OUTPUT

```
RaidGroup ID:  0
List of luns:  20

RaidGroup ID:  1
List of luns:  4094 4095 4092 4093 4090 21

RaidGroup ID:  2
List of luns:  10 11 12 13 14

RaidGroup ID:  3
List of luns:  4091 16 17 18 19

RaidGroup ID:  4
List of luns:  0 1 2 3 4
```

inserttestevent

Inserts an event into the event monitor log to let you verify the accuracy of an event monitor template

PREREQUISITES

For **naviseccli**, you must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **naviseccli inserttestevent** command inserts a dummy event of code in the event log. The event is code 0x2003 and its description is `Test Event - internal use` only. The event is in the local event queue for processing.

To verify that the monitoring agent will respond as specified (for example, issue email, send a page) use the **responsetest** command.

SYNTAX

inserttestevent

EXAMPLE

For `ss1_spa`, this command writes a test event into the log file.

```
naviseccli -h ss1_spa inserttestevent
```

ioportconfig -list

Displays information about all I/O modules and corresponding I/O ports.

PREREQUISITES

For **naviseccli**, you must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **naviseccli ioportconfig -list** command displays the information about all I/O modules and I/O ports on the CX4 series system.

SYNTAX

ioportconfig -list -iomodule *onboard|slot_num* [**-sp** *a|b*] [**-pportid**] [**-port role**] [**-portusage**] [**-porttype**] [**-portstate**] [**-portsubstate**] [**-isportpersisted**] [**-lportid**] [**-all**]

OPTIONS

-list

Displays information about all I/O modules and I/O ports (for both SPs).

-iomodule *onboard|slot_num*

Displays information about the module and all I/O ports that exist on the given module. If the *slot_num* is not provided, the system returns an error.

-sp *a|b*

If the **-sp** switch is not specified, then information about the I/O module with the given *slot_num* for both SPs will be shown.

-pportid

Displays the physical port number.

-portrole

Displays whether the port is operating as a front-end or back-end port. If not persisted, this field displays an `error Uninitialized`.

-portusage

Indicates how the port is being used. If the port is a MirrorView port, it displays `Special`. If the port is initialized, and is not the MirrorView port, it displays `Normal`. If the port is not initialized, the state is `Uninitialized`. Refer to *EMC MirrorView/Asynchronous Command Line Interface (CLI) Reference* for information about the MirrorView ports for the various systems.

-porttype

Displays the port transport type (Fibre Channel or iSCSI).

-portstate

Displays the state of the port. If not persisted, this field displays `Uninitialized`.

-portsubstate

Provides a detailed description of why the port is in a particular state.

-isportpersisted

Indicates whether the port is currently persisted.

-lportid

Shows the logical port ID.

EXAMPLE # 1

This example displays the information for I/O module 2 for SP A.

```
naviseccli -h ss1_spa ioportconfig -list -iomodule 2 -sp a
```

EXAMPLE # 2

This example shows information about the Supercell SLIC in slot 1.

```
naviseccli -h ss1_spa ioportconfig -list -all
```

```
SP ID:   A
I/O Module Slot:   1
I/O Module Type:   iSCSI
I/O Module State:   Present
I/O Module Substate:   Good
I/O Module Power state:   On
I/O Carrier:   No
I/O Module Label:   1 GbE iSCSI/TOE

Information about each port on this I/O module
Physical Port ID:   0
Port Role:   FE
Logical Port ID:   4
Port Usage:   Normal
Port Type:   iSCSI
Port State:   Enabled
Port Substate:   Good
Is Persisted:   Yes

Physical Port ID:   1
Port Role:   FE
Logical Port ID:   5
Port Usage:   Special
Port Type:   iSCSI
Port State:   Enabled
Port Substate:   Good
Is Persisted:   Yes

Physical Port ID:   2
Port Role:   FE
Logical Port ID:   6
Port Usage:   Normal
Port Type:   iSCSI
Port State:   Enabled
Port Substate:   Good
Is Persisted:   Yes

Physical Port ID:   3
Port Role:   FE
Logical Port ID:   7
Port Usage:   Special
Port Type:   iSCSI
Port State:   Enabled
Port Substate:   Good
Is Persisted:   Yes
```

EXAMPLE # 3

This example shows the port information for a Hypernova SLIC in slot 1.

```
naviseccli -h ss1_spa ioportconfig -list -iomodule 1 -sp a -all
```

```
SP ID:   A
I/O Module Slot:   1
I/O Module Type:   SAS
I/O Module State:   Present
I/O Module Substate:   Good
I/O Module Power state:   On
I/O Carrier:   No
I/O Module Label:   6 Gb SAS v1

Information about each port on this I/O module
Physical Port ID:   0
Port Role:   BE
Logical Port ID:   0
Port Usage:   Normal
Port Type:   SAS
Port State:   Enabled
Port Substate:   Good
Is Persisted:   Yes

Physical Port ID:   1
Port Role:   BE
Logical Port ID:   1
Port Usage:   Normal
Port Type:   SAS
Port State:   Enabled
Port Substate:   Good
Is Persisted:   Yes

Physical Port ID:   2
Port Role:   BE
Logical Port ID:   2
Port Usage:   Normal
Port Type:   SAS
Port State:   Enabled
Port Substate:   Good
Is Persisted:   Yes

Physical Port ID:   3
Port Role:   BE
Logical Port ID:   3
Port Usage:   Normal
Port Type:   SAS
Port State:   Enabled
Port Substate:   Good
Is Persisted:   Yes
```

OUTPUT

The following example shows the output for the **ioportconfig -list -iomodule onboard -sp a** command with two BE SAS ports and four FE Fibre Channel ports, including the Mirror View port.

```
Information about each I/O module(s) on
SPA:

SP ID: A
I/O Module Slot: Onboard
I/O Module Type: Multi Protocol
I/O Module State: Present
I/O Module Substate: Good
I/O Module Power state: N/A
I/O Carrier: No
I/O Module Label: N/A

Information about each port on this I/O module:
Physical Port ID: 0
Port Role: BE
Logical Port ID: 0
Port Usage: Normal
Port Type: SAS
Port State: Enabled
Port Substate: Good
Is Persisted: Yes

Physical Port ID: 1
Port Role: BE
Logical Port ID: 1
Port Usage: Normal
Port Type: SAS
Port State: Enabled
Port Substate: Good
Is Persisted: Yes

Physical Port ID: 2
Port Role: FE
Logical Port ID: 0
Port Usage: Normal
Port Type: Fibre Channel
Port State: Enabled
Port Substate: Good
Is Persisted:Yes

Physical Port ID: 3
Port Role: FE
Logical Port ID: 1
Port Usage: Normal
Port Type: Fibre Channel
Port State: Enabled
Port Substate: Good
Is Persisted: Yes

Physical Port ID: 4
Port Role: FE
Logical Port ID: 2
Port Usage: Normal
Port Type: Fibre Channel
Port State: Enabled
Port Substate: Good
Is Persisted: Yes

Physical Port ID: 5
Port Role: FE
Logical Port ID: 3
```

```
Port Usage: Special
Port Type: Fibre Channel
Port State: Enabled
Port Substate: Good
Is Persisted: Yes
```

The following example shows the output for the **ioportconfig -list -iomodule onboard -sp a -label** command.

```
Information about each I/O module(s) on SPA
SP ID:   A
I/O Module Slot:   Onboard
I/O Module Type:   Multi Protocol
I/O Module State:   Present
I/O Module Substate:   Good
I/O Module Power state:   N/A
I/O Carrier:   No
I/O Module Label:   N/A
```

The following example shows the output for the **ioportconfig -list -iomodule 1 -sp a -all** command with the new "Disabled" port state.

```
Information about each I/O module(s) on SPA
SP ID:   A
I/O Module Slot:   0
I/O Module Type:   Fibre Channel
I/O Module State:   Present
I/O Module Substate:   Good
I/O Module Power state:   On
I/O Carrier:   No
I/O Module Label:   8 Gb Fibre

Information about each port on this I/O module
Physical Port ID:   0
Port Role:   FE
Logical Port ID:   6
Port Usage:   Normal
Port Type:   Fibre Channel
Port State:   Enabled
Port Substate:   Good
Is Persisted:   Yes

Physical Port ID:   1
Port Role:   Unknown
Logical Port ID:   N/A
Port Usage:   Uninitialized
Port Type:   Fibre Channel
Port State:   Disabled
Port Substate:   User Initiated
Is Persisted:   No

Physical Port ID:   2
Port Role:   Unknown
Logical Port ID:   N/A
Port Usage:   Uninitialized
Port Type:   Fibre Channel
Port State:   Disabled
Port Substate:   Encryption Required
Is Persisted:   No

Physical Port ID:   3
Port Role:   Unknown
Logical Port ID:   N/A
Port Usage:   Uninitialized
Port Type:   Fibre Channel
Port State:   Disabled
Port Substate:   Hardware Fault
Is Persisted:   No
```

The following example shows the output for the **ioportconfig -list -iomodule 1 -sp a -all** command with the new "Unavailable" port state.

```
SP ID:   A
I/O Module Slot:   1
I/O Module Type:   iSCSI
I/O Module State:   Present
I/O Module Substate:   Good
I/O Module Power state:   On
I/O Carrier:   No
I/O Module Label:   1 GbE iSCSI/TOE

Information about each port on this I/O module
Physical Port ID:   0
Port Role:   FE
Logical Port ID:   7
Port Usage:   Normal
Port Type:   iSCSI
Port State:   Enabled
Port Substate:   Good
Is Persisted:   Yes

Physical Port ID:   1
Port Role:   FE
Logical Port ID:   8
Port Usage:   Special
Port Type:   iSCSI
Port State:   Enabled
Port Substate:   Good
Is Persisted:   Yes

Physical Port ID:   2
Port Role:   Unknown
Logical Port ID:   9
Port Usage:   Uninitialized
Port Type:   iSCSI
Port State:   Unavailable
Port Substate:   Unavailable
Is Persisted:   No

Physical Port ID:   3
Port Role:   FE
Logical Port ID:   10
Port Usage:   Uninitialized
Port Type:   iSCSI
Port State:   Unavailable
Port Substate:   Unavailable
Is Persisted:  No
```

ioportconfig -persist

Writes the port configuration information to persistent memory

PREREQUISITES

For **naviseccli**, you must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **naviseccli ioportconfig -persist** command writes all port configuration information on the subsystem to persistent memory and reboots both SPs. You can specify the delay value for writing the port configuration information. If you do not specify the delay, then the system takes the default value of 360 seconds.

SYNTAX

ioportconfig -persist [**-delay** *delay*] [**-o**]

OPTIONS

-delay *delay*

Delays the coordinated reboot between SPs for the specified value. The value ranges from 0 to 1140 seconds. The default value is 360 seconds.

-o

Executes the command without prompting for confirmation.

EXAMPLE

```
naviseccli -h ioportconfig -persist -delay 20
```

OUTPUT

```
This operation will cause both SPs to reboot in a coordinated
fashion. DO YOU WISH TO CONTINUE (Y/N)?
```

luncache -clear

Clears the LUN offline (cache dirty) condition

PREREQUISITES

For **naviseccli**, you must have a user account on the system on which you want to execute the command.

You can verify the offline condition of a LUN, using the **luncache -list** command.

DESCRIPTION

The **naviseccli luncache** command with the **-clear** function clears the LUN offline (cache dirty) condition. You can clear the LUN offline condition for a specific LUN, or for all LUNS on the system.

When a storage processor (SP) fails, writes destined for a LUN that have not yet been flushed to disk place the LUN in an offline (cache dirty) condition. LUNs in an offline condition are inaccessible until pending writes for the LUN are cleared.

Note: When you execute **luncache -clear**, all pending writes on the LUN are lost. You must issue the command to the SP that owns the LUN. The **luncache -clear** command does not support thin LUNs.

SYNTAX

luncache *lun-number* **-clear** [**-o**]

OPTIONS

lun-number

Specifies the LUN for which to clear the LUN offline condition. If you do not specify a LUN number, clears the LUN offline condition for all LUNS on the system.

-o

Executes the command without prompting for confirmation.

EXAMPLE

This command clears the LUN offline condition for the specified LUN.

```
naviseccli -h ss1_spa luncache 9 -clear
```

```
Bringing the LUN online will cause all pending writes
on the LUN to be lost.

Do you want to bring the LUN online now? (y/n)
```

OUTPUT

None if the command succeeds; status or error information if it fails.

luncache -list

Returns LUN offline (cache dirty) condition information

PREREQUISITES

For **naviseccli**, you must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **naviseccli luncache** command with the **-list** function returns the LUN offline (cache dirty) condition information. You can return information for a specific LUN or for all LUNS on the system.

When a storage processor (SP) fails, writes destined for a LUN that have not yet been flushed to disk place the LUN in an offline (cache dirty) condition. LUNs in an offline condition are inaccessible until pending writes for the LUN are cleared.

Note: You must issue the command to the SP that is the default owner of the LUN which is not necessarily the current owner. You can clear the LUN offline condition using **luncache -clear**. The **luncache -list** command does not support thin LUNs.

SYNTAX

luncache *lun-number* **-list**

OPTIONS

lun-number

Indicates the LUN for which to display LUN offline condition information. If you do not specify a LUN number, LUN offline condition information is returned for all LUNS on the system.

EXAMPLE

This command displays LUN offline condition information for the specified LUN.

```
naviseccli -h ss1_spa luncache 9 -list
```

OUTPUT

```
LUN Offline (Cache Dirty Condition):    YES
```

managedby

Displays the application that manages the system

PREREQUISITES

For **naviseccli**, you must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **naviseccli managedby** command displays whether Unisphere or the Navisphere Express application manages the AX4-5 series and AX series system you specify.

You use the **managedby** command for purposes of the VSS Provider. The VSS Provider is used in conjunction with the SnapView functionality, to provide backup capabilities. See the *EMC CLARiiON Server Support Products for Windows Installation Guide* for information on the VSS Provider.

If Navisphere Express manages the system, the VSS Provider limits some actions. You can use the **managedby** command to determine whether the system you specify is managed by Unisphere or Navisphere Express.

Note: The command returns an output value of `Navi Manager` (Unisphere), `Navi Express` (Navisphere Express), or `None`. A value of None is synonymous to Unisphere.

SYNTAX

managedby

EXAMPLE

This command displays the application that manages the AX series system specified. The system is managed by Unisphere.

```
naviseccli -h ss1_spa managedby
```

OUTPUT

```
Managed By: Navi Manager
```

managefiles -delete

Deletes SP logging files on the specified system.

PREREQUISITES

For **naviseccli**, you must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **naviseccli managefiles** command with the **-delete** function lets you delete SP logging files from supported directories.

Note: The dumps and logs directories are supported for **managefiles**.

You can specify the files you want to delete by using the **-all** or **-file** switches, or you can omit switches and display a list of files, and then choose a file from the list.

SYNTAX

managefiles -delete [**-all**] [**-file** *filenames*] [**-o**]

OPTIONS

-all

Deletes all the files from the supported directory.

-file *filenames*

Deletes the specified files from the supported directory.

-o

Executes the command without prompting for confirmation.

EXAMPLE

This command shows you all file index numbers and names. The files appear in the format shown below. You then enter the file you want to delete, by either its index number or name.

```
naviseccli -h ss1_spa managefiles -delete
```

```
Index Size  Last modified       Filename
0     0     10/26/2000 17:39:53 naviagent_Oct-26-00_13-36-17.log
1     138   10/27/2000 12:37:19 naviagent_Oct-26-00_13-48-40.log
2     0     10/27/2000 13:20:53 naviagent_Oct-27-00_08-48-38.log
3     0     10/27/2000 13:29:57 naviagent_Oct-27-00_09-29-57.log
4     0     10/27/2000 18:31:42 naviagent_Oct-27-00_11-06-09.log
5     0     10/27/2000 18:41:37 naviagent_Oct-27-00_14-41-37.log


Enter files to be deleted with index separated by comma
(1,2,3,4-5) OR a range (1-3) OR enter 'all' to delete all
file OR 'quit' to quit> 2

Files selected to be deleted are

naviagent_Oct-27-00_08-48-38.log

Do you want to continue(y/n)[n]? (y/n)? y

File naviagent_Oct-27-00_08-48-38.log is deleted.
```

OUTPUT

None if the command succeeds; status or error information if it fails.

managefiles -list

Lists SP logging files in supported directories

PREREQUISITES

For **naviseccli**, you must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **naviseccli managefiles** command with the **-list** function lets you display a list of SP logging files in supported directories.

Note: The dumps and logs directories are supported for **managefiles**.

SYNTAX

```
managefiles -list
```

EXAMPLE

This command shows you a list of files in the supported directories, for the system you specify.

```
naviseccli -h ss1_spa managefiles -list
```

OUTPUT

```
Index Size  Last modified       Filename
0     0     10/26/2000 17:39:53 naviagent_Oct-26-00_13-36-17.log
1     138   10/27/2000 12:37:19 naviagent_Oct-26-00_13-48-40.log
2     0     10/27/2000 13:20:53 naviagent_Oct-27-00_08-48-38.log
3     0     10/27/2000 13:29:57 naviagent_Oct-27-00_09-29-57.log
4     0     10/27/2000 18:31:42 naviagent_Oct-27-00_11-06-09.log
5     0     10/27/2000 18:41:37 naviagent_Oct-27-00_14-41-37.log
```

managefiles -retrieve

Retrieves SP logging files from a remote system to the local system

PREREQUISITES

For **naviseccli**, you must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **naviseccli managefiles** command with the **-retrieve** function lets you retrieve SP logging files from supported directories on a remote system to the local system.

Note: The dumps and logs directories are supported for **managefiles**.

You can specify the files you want to retrieve by using the **-all** or **-file** switches, or you can omit switches and display a list of files, and then choose a file from the list.

SYNTAX

managefiles -retrieve [**-path** *path*] [**-all**] [**-file** *filenames*] [**-o**]

OPTIONS

-path *path*

Specifies the path on the local system where you want to copy the file. If you do not use this switch, the file is copied to the current directory.

-all

Retrieves all files from the supported directory.

-file *filenames*

Retrieves the specified files from the supported directory.

-o

Executes the command without prompting for confirmation.

EXAMPLE

This command shows you all file index numbers and names. The files appear in the format shown below. You then enter the file you want to retrieve, by either its index number or name.

```
naviseccli -h ss1_spa managefiles -retrieve


Index Size  Last modified       Filename
0     0     10/26/2000 17:39:53 naviagent_Oct-26-00_13-36-17.log
1     138   10/27/2000 12:37:19 naviagent_Oct-26-00_13-48-40.log
2     0     10/27/2000 13:20:53 naviagent_Oct-27-00_08-48-38.log
3     0     10/27/2000 13:29:57 naviagent_Oct-27-00_09-29-57.log
4     0     10/27/2000 18:31:42 naviagent_Oct-27-00_11-06-09.log
5     0     10/27/2000 18:41:37 naviagent_Oct-27-00_14-41-37.log


Enter files to be retrieved with index seperated by comma
(1,2,3,4-5) OR a range (1-3) OR enter 'all' to retrieve
all file OR 'quit' to quit> 2

Files selected to be retrieved are
naviagent_Oct-27-00_08-48-38.log

Do you want to continue(y/n)[n]? (y/n)? y

File naviagent_Oct-27-00_08-48-38.log is retrieved to the current
directory.
```

OUTPUT

None if the command succeeds; status or error information if it fails.

ndu -list

Describes installed SP driver software packages

PREREQUISITES

For **naviseccli**, you must have a user account on the system on which you want to execute the command.

You must be able to log in to the host running Navisphere CLI.

DESCRIPTION

The **ndu** command provides nondisruptive upgrades on CX3 series and CX series systems. This command lets you install and upgrade system software without disrupting any I/O from attached servers. Third-party software installation is not supported. This means you can use ndu to install FLARE software bundles or enablers.

Note: For AX series systems the process is disruptive.

Use the **-list** function with no switches to display all the information about all software packages.

Note: The **ndu** command is not supported on NetWare and HP-UX operating systems. The **ndu** command is only supported by Secure CLI in Navisphere CLI versions 6.24 and later.

The **naviseccli ndu** command with the **-list** function and no switches displays information about all installed software packages. The format looks like this:

```
Name of the software package:     name
Revision of the software package: n.nn
Commit Required:                  yes or no or
                                  already committed
Revert Possible:                  yes or no
Active State:                     yes or no
Is installation complete          yes or no or not
                                  applicable.
Is this System Software:          yes or no
```

For information on one package, use the **-name** switch. For a subset of package information, use one or more additional switches.

After listing installed driver packages, you can perform other ndu (non-disruptive upgrade) steps, such as **ndu -commit** or **ndu -revert**.

SYNTAX

ndu -list [**-name** [*name*]] [**-rev**] [**-iscommitable**] [**-isrevertable**] [**-isactive**] [**-iscomplete**] [**-issystem**] [**-gen**]

OPTIONS

-name [*name*]

Without the *name* argument, displays only the names of packages; with *name*, displays information on the package *name*.

-gen

Displays the generation of the package.

-rev

Displays the package revision.

-iscommitable

Displays `yes` if the package can be committed, `no` if it cannot.

-isrevertable

Displays `yes` if the package can be reverted (it is not committed), `no` if it cannot be.

-isactive

Displays `yes` if the package is active, `no` if it is not.

-iscomplete

Displays `yes` if the package file contains a complete set of files, `no` or not applicable if it does not.

-issystem

Displays `yes` if the package is a factory-supplied system driver, `no` if it is not.

EXAMPLE

For the SP with hostname payroll_storage_SPA, this command lists all installed driver packages. For sample output, see previous page.

```
naviseccli -h payroll_storage_SPA ndu -list
```

OUTPUT

See previous page. If the version of FLARE software running on the SP does not support this command, a `Not supported` error message is printed to stderr.

ndu -install

Transfers SP software driver packages to the system private LUN (PSM LUN)

PREREQUISITES

For **naviseccli**, you must have a user account on the system on which you want to execute the command.

You must have a user entry in the Unisphere agent configuration file.

Preinstallation validation checks

Preinstallation validation checks identify unsupported or unsafe installation conditions. You initiate the validation checks functionality when you issue the **ndu -install** command. The validation checks run in the background, prior to installing the software. If a validation check fails, the CLI displays the error and terminates the installation. You can choose to display all validation checks as the functionality executes by specifying the **-verbose** switch, otherwise the CLI only displays failures that prevent installation. The following responses exist for each validation check:

Response	Definition
Successful	Validation check is successful. Installation proceeds.
Warning	Conditions exist that may need correction. Installation proceeds.
Failure	Conditions exist that require correction before installation can proceed. Installation terminates.

Note: The preinstallation validation checks identify a series of unsupported or unsafe installation conditions, but cannot guarantee a successful install.

In addition to the user access requirements for the **ndu** command, the validation check has associated configuration requirements that you must follow:

- Create the required user accounts on the system (see Getting started with Secure CLI on page 33). You can create the user accounts using the Secure CLI syntax.
- Create a security file on the host. If you do not create a security file, the CLI prompts you for a valid username, password and scope:

```
Security File does not exist
Please enter security information to proceed:
   Enter User (Existing user on system)
   Enter Password
   Enter Scope (0 - global [default]; 1 - local
```

Note: If the system is uninitialized, user credential information is not required. Therefore, a security file is not required and the CLI does not prompt you for a username, password and scope.

The **ndu** command is not supported on NetWare and HP-UX operating systems. The **ndu** command is only supported by Secure CLI in Navisphere CLI versions 6.24 and later.

You can also issue validation checks without installing or upgrading software (see **ndu -runrules**).

Note: Use the naviseccli **ndu -list** command to display installed package information. If the **ndu -install** command succeeds, the SPs restart.

DESCRIPTION

The **ndu** command with the **-install** function transfers files from media to the system, queries and displays information about the packages, and then installs or upgrades selected software packages.

Note: For AX series systems the process is disruptive. The **ndu** command is not supported on NetWare and HP-UX operating systems. The **ndu** command is only supported by Secure CLI in Navisphere CLI versions 6.24 and later.

The **naviseccli ndu** command **-install** function transfers one or more SP driver packages from a user-accessible file system to the system private storage LUN (PSM). Media should be present before you issue this command.

Note: Beginning with FLARE Operating Environment version 02.19.xxx.5.yyy, when you execute **ndu -install**, the CLI performs a series of preinstallation validation checks on a CX3 series, CX series, AX4-5 series, or AX series systems, prior to installing or upgrading customer-installable software packages. Prior to issuing the install, you must satisfy the specified configuration requirements for the preinstallation validation checks functionality, or the installation will not complete. See Prequisites in ndu -install on page 250 for configuration requirements.

You should use a Windows-based management software (either Unisphere or Navisphere CLI) to install software.

Before starting a non-disruptive software installation, record the read and write cache sizes because they will be set to zero.

Before the SP starts a nondisruptive software installation, it disables the caches and sets their sizes to zero. If the write cache is full and I/O is heavy, disabling the cache may take over an hour because the cached data must be written to disk. After the data is written, the installation starts.

When you install new SP software using the CLI, the only way to determine when the installation is finished is to issue periodic ndu **-status** commands until the CLI shows the operation is completed.

When the installation is complete, restore the cache sizes to their original sizes if possible. You may not be able to use the original sizes because the new software requires more memory than the version that it replaced.

The software prompts for information as needed; then it installs or upgrades the specified software packages and restarts the SPs. The SPs then load and run the new packages. After successful installation, it deletes the files from the system.

You can install more than one package with one **ndu** command.

Note: When you install an upgrade (that is, a newer version of an installed package), you must install all the software packages you want to use in the same command. For example, if you are upgrading SnapView in a system that has SnapView, Access Logix, and FLARE software installed, then you must upgrade all three using one **ndu -install** command. When you install a new package of the same revision as other existing packages, you may install only that package and not the others.

The CLI takes the following actions in order:

- If it can find the packages, it transfers them without interaction. If it can find the packages, it transfers them without interaction.
- Unless you used **-force** (which prevents the prompt and is equivalent to the `all` response), the software examines each package and displays the following information for confirmation:

```
Item number:                        n
Name of the software package:       driver-name
Revision of the software package: n.nn
Already Installed Revision:         NO or YES
Installable                         YES or NO

Enter Item number of the packages to be installed separated
by blanks. Enter 'all' for all packages and
'quit' to quit without installing:
```

Specify the package(s) you want installed. If you make an invalid choice, the CLI does not install any package.

Note: Do not change the configuration; for example, binding new LUNs or expanding metaLUNs while a software install is in progress. Such operations will be rejected; delay them until after the software upgrade is complete and committed.

SYNTAX

ndu -install *pathlist* **[-delay** *seconds*] [**-force**] [**-gen**] [**-verbose**]

OPTIONS

pathlist

Specifies filenames, with full pathnames, of the software packages to be installed. You can use a Windows or UNIX pathname (for example, `C:\temp` or `/usr/bin`). Enclose the pathname list in quotes and separate multiple names by a space. If you are installing a newer version of an existing package, you must install all other packages (as explained above).

-delay *delay*

Specifies the delay time that allows attached hosts enough time after SP B has finished rebooting to rescan and mark paths available to SP B, before SP A reboots. The minimum allowed delay is zero seconds and the maximum allowed is 1140 seconds. In most cases, the EMC recommended NDU delay of 360 seconds should be used. However, some host configurations (such as those using Veritas DMP) may require a longer delay.

-force

Installs without user interaction. If any package is not installed for any reason, the software displays an error message and continues installing other packages specified in the command.

-gen

Displays the generation of the package.

-verbose

Displays all results of the preinstallation validation checks. Without this switch, only errors that prevent installation (failures) are displayed.

EXAMPLE

For the SP with hostname 10.14.12.74, this command installs the FLARE Operating Environment bundle.

```
naviseccli -h ss1_spa ndu -install CX400-02.07.400.3.107.lst


Item number:                        0
Name of the software package:       FLARE-Operating-Environment
Revision of the software package:   02.07.400.3.107
Already Installed Revision:         02.07.400.3.10
Installable                         YES
Disruptive upgrade:                 NO

The requested package(s) will be installed. Do you wish
to proceed?: (y/n)? y
```

OUTPUT

If the version of FLARE software running on the SP does not support this command, a `Not supported` error message is printed to stderr. Other error message(s):

```
NDU_NOT_SUPPORTED
 NDU_CANNOT_FIND_FILE NDU_CANNOT_XFER_FILE INVALID_PACKAGE
```

ndu -runrules

Executes the preinstallation validation checks

PREREQUISITES

For **naviseccli**, you must have a user account on the system on which you want to execute the command.

You must have a user entry in the Unisphere agent configuration file.

DESCRIPTION

The **naviseccli ndu** command with the **-runrules** function executes the preinstallation validation checks, without performing software installation (see**ndu -install**).

Note:

The **ndu -runrules** command has associated configuration requirements for the preinstallation validation checks functionality. See Preinstallation validation checks under ndu -install on page 250.

The **ndu** command is not supported on NetWare and HP-UX operating systems. The **ndu** command is only supported by Secure CLI in Navisphere CLI versions 6.24 and later.

Note: Use the **naviseccli ndu -install** command to both run the preinstallation validation checks and install software.

SYNTAX

ndu -runrules [*pathlist*] [**-listrules**] [**-verbose**]

OPTIONS

pathlist

Specifies filenames, with full pathnames, of the software packages to be committed.

-listrules

Displays a list of preinstallation validation checks that would run for the specified host. The validation checks do not execute. To run the validation checks, do not include this switch.

-verbose

Displays all results of the preinstallation validation checks. Without this switch, only errors that prevent installation (failures) are displayed.

EXAMPLE

For the SP with hostname payroll_storage_SPA, this command executes the preinstallation validation checks.

```
naviseccli -h ss1_spa ndu -runrules
```

OUTPUT

If the preinstallation validation checks detect failures, the failures are displayed.

ndu -commit

Commits (makes permanent) an installed system driver package

PREREQUISITES

For **naviseccli**, you must have a user account on the system on which you want to execute the command.

You must have a user entry in the Unisphere agent configuration file.

DESCRIPTION

The **naviseccli ndu** command with the **-commit** function commits an installed software package. Every package does not require commit.

If a package needs to be committed and it is not committed, all new features of the newly installed package may not be available. A committed package cannot be reverted. It can be uninstalled.

Note: You cannot create any new RAID groups or bind any new LUNs until you commit FLARE and Access Logix software.

The **ndu** command is not supported on NetWare and HP-UX operating systems. The ndu command is only supported by Secure CLI in Navisphere CLI versions 6.24 and later.

Use the **naviseccli ndu -list**command to display installed package information.

SYNTAX

ndu -commit *namelist*

OPTIONS

namelist

Lists package names of the software packages to be committed.

EXAMPLE

For the SP with hostname payroll_storage_SPA, this command commits the installed package mypackage.

```
naviseccli -h ss1_spa ndu -commit mypackage
```

OUTPUT

If the version of FLARE software running on the SP does not support this command, a `Not supported` error message is printed to stderr.

ndu -status

Returns the status of the ndu install, commit, or revert operations

PREREQUISITES

For **naviseccli**, you must have a user account on the system on which you want to execute the command.

You must have a user entry in the Unisphere agent configuration file.

DESCRIPTION

The **naviseccli ndu** command with the **-status** function reports the progress of the last **ndu -install**, **-commit**, or **-revert** function executed.

Note: Use the **naviseccli ndu -list** command to display installed package information.

The **ndu** command is not supported on NetWare and HP-UX operating systems. The **ndu** command is only supported by Secure CLI in Navisphere CLI versions 6.24 and later.

SYNTAX

ndu -status [**-clear**]

OPTIONS

-clear

Clears the status of the last executed **ndu** command.

EXAMPLE

For the SP with hostname payroll_storage_SPA, this command reports the status of the **ndu -install**, **-commit**, or **-revert** function.

```
naviseccli -h ss1_spa ndu -status
```

OUTPUT

If the version of FLARE software running on the SP does not support this command, a `Not supported` error message is printed to stderr.

ndu -revert

Returns to (restores functionality of) the previous revision of an installed system driver

PREREQUISITES

For **naviseccli**, you must have a user account on the system on which you want to execute the command.

You must have a user entry in the Unisphere agent configuration file.

DESCRIPTION

The **naviseccli ndu** command with the **-revert** function restores the functionality of the previous revision of an installed driver package. A committed package cannot be reverted, nor can a package that had no previous revision installed. After the command succeeds, the SPs will restart.

If you omit the **-o** (override) switch, the CLI prompts for confirmation:

```
Revert operation will revert package-name from
 both SPs. Do you still want to revert. (y/n)?
```

Answer `y` to revert; answer `n` to cancel the command.

Note:

Use the **naviseccli ndu -list** command to display installed package information.

The **ndu** command is not supported on NetWare and HP-UX operating systems. The **ndu** command is only supported by Secure CLI in Navisphere CLI versions 6.24 and later.

SYNTAX

ndu -revert [**-delay** *seconds*] *namelist* [**-o**]

OPTIONS

-delay *seconds*

Specifies the delay time that allows attached hosts enough time after SP B has finished rebooting to rescan and mark paths available to SP B, before SP A reboots. The minimum allowed delay is zero seconds and the maximum allowed is 1140 seconds. In most cases, the EMC recommended NDU delay of 360 seconds should be used. However, some host configurations (such as those using Veritas DMP) may require a longer delay.

namelist

Lists package names of the software packages to be reverted.

-o

Executes the command without prompting for confirmation.

EXAMPLE

For the SP with hostname payroll_storage_SPA, this command reverts to the previous revision of mypackage for both SPs.

```
naviseccli -h ss1_spa ndu -revert mypackage
```

OUTPUT

If the version of FLARE software running on the SP does not support this command, a `Not supported` error message is printed to stderr. Other errors:

```
NDU_CANNOT_FIND_FILE
 NDU_CANNOT_XFER_FILE INVALID_PACKAGE
```

networkadmin -get

Lists network name and address information

PREREQUISITES

For **naviseccli**, you must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **naviseccli networkadmin** command with **-get** function without switches lists all the network information for an SP. This command supports IPv6 network communication to the management ports of systems with FLARE version 04.28 or later. If you do not specify the IP address (either IPv4 or IPv6), then by default IPv4 information is displayed. The default IP address is IPv4. If the **-ipv4** and the **-ipv6** switches are specified, the information is displayed for both IP addresses with the IPv4 information listed first.

Issue the command to the SP for which this information is needed.

Issuing this command with one or more switches displays the information based on the specified switch. The line `Storage Processor:` is always displayed. This command displays information in the following format:

```
Storage Processor:                  SP-id (A or B)
Storage Processor Network Name:     SP-network-name
Storage Processor IP Address:       SP-IP-address
Storage Processor Subnet Mask:      SP-subnet-mask
Storage Processor Gateway Address: SP's-gateway-system address
```

Note: If you need to change an SP network name or address, then use the **networkadmin** command with the **-set** function described in networkadmin -set on page 272.

SYNTAX

networkadmin -get [**-sp a**|**b**] [**-name**] [**-portid** *portid* [**-vportid** *vportid*]] [**-vlanid**] [**-ipv4** [**-mode**] [**-address**] [**-subnetmask**] [**-gateway**]] [**-ipv6** [**-mode**] [**-address**] [**-globalprefix**] [**-gateway**]] [**-speed**][**-auto**] [**-capablespeeds**] [**-requestedspeed**] [**-linkstatus**] [**-all**]

OPTIONS

-sp [a|b]

Displays the properties of the specified SP. The default is the properties of the connected SP.

-portid *portid*

Displays the management port ID. If you do not specify the port ID, the system displays the information of all management ports.

-vportid *vportid*

Displays the virtual port ID associated with the management port. If you do not specify the virtual port ID, the system displays the information of all virtual ports.

-vlanid

Displays the virtual LAN (VLAN) ID of the management port/virtual port. If the VLANs are disabled, the system displays `Disabled`.

-name

Displays the SP's network name.

-ipv4

Displays all the IPv4 information. This is the default IP address.

-ipv6

Displays all the IPv6 information.

-address

Displays the SP's network IP address (IPv4/IPv6 address).

-gateway

Displays the IP address (IPv4/IPv6 address) of the SP's gateway system.

-subnetmask

Displays the SP's IPv4 subnet mask.

-globalprefix

Displays the SP's IPv6 global prefix.

-mode

Displays the IPv4/IPv6 status. The statuses are automatic, manual, and disabled.

-speed (CX4 series only)

Displays the current port speed for a specified SP.

-auto (CX4 series only)

Indicates whether the auto-negotiate feature is turned on or off. The CLI returns a `yes` value if the feature is turned on, a `no` value if the feature is turned off, and a `not supported` value if the feature is not supported.

Note: If you have the auto-negotiate feature turned on, the speed value that is generated in the output will not be auto. The value reflects the speed at which the port is currently operating. If you have the Auto-Negotiate feature turned on and you specify the **-requestedspeed** switch, the Requested Value displays a value of `auto`.

-capablespeeds (CX4 series only)

Returns a list of valid speed values for each port.

-requestedspeed (CX4 series only)

Displays the requested speed value.

-linkstaus (CX4 series only)

Displays the link status of the management port.

-all (CX4 series only)

Displays all information for the network admin command.

Note: The command switches **-speed**, **-auto**, **-capablespeeds**, **-requestedspeed**, **-linkstatus**, **-portid**, **-vportid**, **-vlanid**, **-ipv4**, **-ipv6**, and **-all** are supported only with Secure CLI.

EXAMPLE # 1

```
naviseccli -h ss1_spa networkadmin -get -speed


Storage Processor SP A
Management Port Settings
Link Status: Link-up
Current Speed: 100 Mbps/half duplex
```

EXAMPLE # 2

```
naviseccli -h ss1_spa networkadmin -get -capablespeeds -auto
```

```
Storage Processor : SP A
Management Port Settings:
Link Status:    Link-up
Current Speed:  100 Mbps/half duplex
Auto-Negotiate: No
Capable Speeds: 10 Mbps half/full duplex
                100 Mbps half/full duplex
                1000 Mbps half/full duplex Auto
```

EXAMPLE # 3

Note: The IPv6 information contains IPv6 in the header to distinguish the output from the IPv4 information.

```
naviseccli -address 10.5.2.12 -user a -password a -scope 0
networkadmin -get -ipv4 -ipv6


Storage Processor: SP A
Storage Processor Network Name: lumpy-spa
Storage Processor IP Address: 10.5.2.12
Storage Processor Subnet Mask: 255.255.255.0
Storage Processor Gateway Address: 10.5.2.1
Storage Processor IPv6 Mode: Automatic
Storage Processor IPv6 Address:
3ffe:80c0:22c:4d:20d:56ff:fec5:bff4
Storage Processor IPv6 Global Prefix: 3ffe:80c0:22c:4d::
Storage Processor IPv6 Local Address:
fe80::20d:56ff:fec5:bff4
Storage Processor IPv6 Gateway Address:
fe80::20a:8bff:fe5a:967c
```

EXAMPLE # 4

```
naviseccli -h ss1_spa networkadmin -get -all
```

```
Storage Processor: SP A
Storage Processor Network Name: kirk-spa

Port ID: 0
Management Port Settings:
Link Status: Link-Up
Current Speed: 100Mbps/full duplex
Requested Speed: Auto
Auto-Negotiate: YES
Capable Speeds: 10Mbps half/full duplex
                100Mbps half/full duplex
                1000Mbps half/full duplex
                Auto

Virtual Port ID: 0
VLAN ID: 102
Storage Processor IP Mode: Manual
Storage Processor IP Address: 10.5.2.178
Storage Processor Subnet Mask: 255.255.255.0
Storage Processor Gateway Address: 10.5.2.1
Storage Processor IPv6 Mode: Automatic
Storage Processor IPv6 Address:
3ffe:80c0:22c:47:260:1600:3ce0:151c
Storage Processor IPv6 Global Prefix:
3ffe:80c0:22c:47::
Storage Processor IPv6 Link-local Address:
fe80::260:1600:3ce0:151c
Storage Processor IPv6 Gateway Address:
fe80::20a:8bff:fe5a:967c
```

OUTPUT

See the previous page. If the version of FLARE software running on the SP does not support this command, a `Not supported` error message is printed to stderr.

If the command switches **`-speed`**, **`-auto`**, **`-capablespeeds`**, **`-requestedspeed`**, **`-linkstatus`**, and **`-all`** are not supported on the system then an `Invalid command line parameters` error message is printed to stderr.

If IPv6 does not support the system an error is displayed:

```
IPv6 is not supported for this platform.
```

IPv6 is enabled but a value for one of the IPv6 values has not been set so, the value will be displayed as an empty string.

networkadmin -mib

Configures the SNMP services on the system SP

PREREQUISITES

For **naviseccli**, you must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **naviseccli networkadmin** command with the **-mib** function enables or disables the processing of SNMP MIB read requests on an SP and sets the SNMP community string. This command with no option lists the current status of the SNMP service.

Note: To discover current settings, use the **networkadmin** command with the **-mib** function.

SYNTAX

networkadmin -mib [**-enable**] [**-disable**] [**-community** *string*] [**-o**]

OPTIONS

-enable

Enables the SNMP services.

-disable

Disables the SNMP services.

-community *newstring*

Sets the SNMP community string to newstring.

Note: The **-community** switch is supported only with ManagementServer release 28 or later.

-o

Executes the command without prompting for confirmation.

EXAMPLE

This command disables the SNMP services on SP A.

```
naviseccli -h ss1_spa networkadmin -mib -disable


Disable processing of SNMP read requests on SP A (y/n)[n]
```

OUTPUT

```
Storage Processor: SP A
SNMP MIB Status:  Disabled
Community: public
```

If the version of FLARE software running on the SP does not support this command, a `Not supported` error message is printed to stderr.

networkadmin -route

Sets up the static routes

PREREQUISITES

For **naviseccli**, you must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **naviseccli networkadmin** command with the **-route** function is used to set up the static routes to the specific hosts or networks.

SYNTAX

```
networkadmin -route [-sp a|b] [-portid portid -vportid vportid] [-add
-destination destination [-subnetmask subnetmask |
-prefixlength length] [-metric metric] [-persistent]]
[-delete -destination destination [-subnetmask subnetmask |
-prefixlength length]] [-list] [-o]
```

OPTIONS

-sp a|b

Specifies the destination SP. The default is the connected SP.

-portid *portid*

The **-portid** and the **-vportid** together specify the interface associated with the route. If you do not specify the interface, the system determines it.

-vportid *vportid*

The **-portid** and the **-vportid** together specify the interface associated with the route. If you do not specify the interface, the system determines it.

-add

Adds a network route.

-destination *destination*

Specifies the IPv4/IPv6 address or the hostname of the destination.

-subnetmask *netmask*

Specifies the IPv4 subnet mask value for the route entry. The default value is 255.255.255.255. It is valid only for an IPv4 destination address.

-prefixlength *length*

Specifies the prefix length and the part of the address to compare while determining the route. The default value is 128. It is valid only for an IPv6 destination address.

-metric *metric*

Determines the best route using the routing algorithm. The route with the lowest metric is preferred over another route.

-persistent

Specifies whether the route should persist across restarts.

-delete

Deletes an existing route.

-list

Displays the routes for the SP. By default, it displays the routes of the connected SP. It also displays the routes for a specific port/virtual port.

-o

Executes the command without prompting for confirmation.

EXAMPLE

```
naviseccli -h kirk-spa networkadmin -route -list
```

OUTPUT

```
SP A, Port 0, Virtual Port 0:
Protocol:                   IPv4
Subnet Mask:                255.255.255.0
Gateway:                    10.5.2.1
Originator:                 OS
Metric:                     10
Destination Address:        10.5.2.0
Persistent:                 YES
Static:                     NO

Protocol:                   IPv4
Subnet Mask:                255.255.255.255
Gateway:                    10.5.2.1
Originator:                 OS
Metric:                     10
Destination Address:        10.255.255.255
Persistent:                 YES
Static:                     NO

Protocol:                   IPv4
Subnet Mask:                240.0.0.0
Gateway:                    10.5.2.1
Originator:                 OS
Metric:                     10
Destination Address:        224.0.0.0
Persistent:                 YES
Static:                     NO

Protocol:                   IPv4
Subnet Mask:                255.255.255.255
Gateway:                    10.5.2.1
Originator:                 OS
Metric:                     1
Destination Address:        255.255.255.255
Persistent:                 YES
Static:                     NO

Protocol:                   IPv6
Destination Prefix Length:  64
Originator:                 OS
Metric:                     8
Destination Address:        3ffe:80c0:22c:47::
Persistent:                 YES
Static:                     NO
```

networkadmin -set

Updates network information for an SP

PREREQUISITES

For **naviseccli**, you must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **naviseccli networkadmin** command with the **-set** function changes one or more network settings for an SP. This command supports IPv6 network communication to the management ports of systems with FLARE version 04.28 or later. If you do not specify the IP address (either IPv4 or IPv6), then by default IPv4 information is displayed. The default IP address is IPv4. If both the **-ipv4** and **-ipv6** switches are specified, the information is displayed for both IP addresses, with the IPv4 information listed first.

Issue the command to the SP whose information you want to update.

If you omit the **-o** (override) option, the CLI displays a message in the following form to confirm the update.

```
Changing the name of SP <A|B>
  from oldname to newname (y/n)[n]?

Changing the IP address of SP
  <A|B> from old-address to new-address (y/n)[n]?

Changing the sub-net mask of SP
  <A|B> from old-mask to new-mask (y/n)[n]?

Changing the gateway address of SP
  <A|B> from old-gateway-address to new-gateway-address (y/n)[n]?
```

To make the change, enter `y`; otherwise, enter `n`.

Note:

To discover current settings, use the **networkadmin** command with the **-get** function.

EMC service personnel set the network properties initially to work at your site. Do not change any value unless you are moving the SP to another LAN or subnet.

If you change any value, after you confirm, the SP restarts and uses the new value.

SYNTAX

networkadmin -set [**-o**] [**-sp a**|**b**] [**-name** *name*] [**-portid** *portid* **-vportid** *vportid*] [**-vlanid** *vlanid* | **-vlandisable**]

[**-ipv4** [**-address** *address*] [**-subnetmask** *subnetmask*] [**-gateway** *gateway-IP-address*]]

[**-ipv6** [**-automatic** | **-disable** | **-manual** [**-globalprefix** *prefix*] [**-gateway** *gateway-IP-address*]]

[**-speed** [**-duplex**]]

OPTIONS

-sp [a|b]

Modifies the properties of the specified SP. The default is the connected SP.

-portid *portid*

Specifies the management port ID. The default management port is 0.

-vportid *vportid*

Specifies the virtual port ID associated with the management port. The default virtual port is 0.

-vlanid *vlanid*

Specifies the VLAN ID to be used for the management port/virtual port. If you specify an invalid VLAN ID or if the ID is already in use, an error message appears displaying the valid range.

-vlandisable

Disables VLAN tagging on the virtual port.

-name *name*

Changes the SP's network name to *name*. The maximum length of the name is 64 characters.

-address *IP-address*

Changes the SP's IPv4 network address to *IP-address*.

-ipv4

Specifies the settings for IPv4.

-ipv6

Specifies the settings for IPv6.

-automatic

Enables IPv6 on the SP automatically.

-disable

Disables IPv6 on the SP.

-manual

Enables IPv6 on the SP. The global prefix and gateway must be set manually.

-gateway *gateway-IP-address*

Changes the SP's IPv4 or IPv6 gateway IP address to *gateway-IP-address*.

-subnetmask *mask*

Changes the SP's IPv4 subnet mask to *mask*.

-globalprefix *prefix*

Changes the SP's IPv6 global prefix to *prefix*.

-speed [-duplex] (CX4 series only)

Changes the speed on the management port for the target SP.

-o

Executes the command without prompting for confirmation.

EXAMPLE # 1

For SP A, this command changes the gateway address.

```
naviseccli -h ss1_spa networkadmin -set -gatewayaddress


Changing the gateway address of SP A from 123.456.789.011 to 123.456.789.011

This operation will cause a management server restart!
Do you wish to continue? (y/n)[n] y
```

EXAMPLE # 2

This command enables IPv6 (if not enabled) and maintains the current settings.

```
naviseccli -address 10.5.2.12 -user a -password a -scope 0
networkadmin -set -ipv6 -manual
```

EXAMPLE # 3

This command enables IPv6 (if not enabled) and sets the IPv6 global prefix.

```
naviseccli -address 10.5.2.12 -user a -password a -scope 0
networkadmin -set -ipv6 -manual -globalprefix 3ffe:80c0:22c:4c:
```

EXAMPLE # 4

For SP A, this command changes the management port speed to 1000 Mbps/half duplex.

```
naviseccli -h ss1_spa networkadmin -set -speed 1000
-duplex half

Change the management port speed for SP A to 1000 Mbps/half duplex
DO YOU WISH TO CONTINUE? (y/n)?
```

OUTPUT

See the description section of this command. If the version of FLARE software running on the SP does not support this command, a `Not supported` error message is printed to stderr. Other errors:

```
NETADMIN_NOT_FOUND
 NETADMIN_INVALID_NAME Invalid command line parameters Invalid speed request
```

port

Lists SP port information, removes an HBA entry from an SP's initiator list, and provides diagnostic capabilities

PREREQUISITES

For **naviseccli**, you must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **naviseccli port** command lists SP port information, removes an HBA entry from an SP's permitted initiator list (initiator record), and provides diagnostic capabilities for SAN Copy initiator records and duplicate host initiator records. See also the **storagegroup -setpath** command in storagegroup on page 334 and the **alpa** command in alpa -set on page 61.

To register an HBA with a system (opposite of removing an HBA entry), use the **register** command.

The optional **port -diagnose** switches are:

[**-sancopy** [**-clean**]] [**-host**]

SYNTAX

port [**-diagnose** [*optional-diagnose-switches*]] [**-list** [*optional-list-switches*]] [**-removeHBA** [*optional-removeHBA -switches*]
[**-o**]

-list [[**-all**] [**-arraycommpath**] [**-arrayhba**] [**-bread**] [**-failovermode**] [**-gname**] [**-hba**] [**-initiatorcount**] [**-mac**] [**-reads**] [**-sfpstate**] [**-sp**]
[**-uid** *StorageGroupUID*] [**-unitserialnumber**] [**-writes**] [**-physical**]
[**-usage**] [**-prominfo**]

-removeHBA [**-hbauid** *hbauid* | **-host** *hostname* |**-hostip** *IPAdress* |**-all**]

OPTIONS

-sancopy [-clean]

Lists the SAN Copy initiator records where the initiator is the same as that of the targeted SP. If you include the optional **-clean** switch, the CLI prompts you to remove the initiator records that are displayed.

-host

Scans the host initiator records and displays duplicate hosts with the same host ID.

Without arguments, **-list** displays information about all ports in the system but does not list information given by **-all**, **-arraycommpath**, and **-failovermode**. This allows **-list** without an argument to produce output compatible with scripts written for Navisphere revisions 5.X. Example 1 shows output without switches. Example 2 shows CLI 6.0.5 output with the **-all** switch. You can use one of the following optional switches with **-list**:

-all

Lists all port information, including any information that is new with this Navisphere release. For script compatibility with revisions of Navisphere before 5.3, use the **-list** without an argument.

-arraycommpath

Displays the status of the **arraycommpath** setting: `0` if **arraycommpath** is disabled; `1` if **arraycommpath** is enabled.

-arrayhba

Displays information about all systems attached to this HBA, or about systems that were logged in at some point for which initiator records still exist. See Example 2 for a display.

-bread

Displays the number of blocks read for each port.

-failovermode

Displays the failover mode: 0, 1, 2, 3, or 4. The **storagegroup -failovermode** description provides more information.

-gname *StorageGroupName*

Specifies a storage group. *StorageGroupName* specifies the user-defined storage group name. If you omit the **-gname** and the **-uid** switches, the CLI describes all HBA ports connected to this storage group.

-hba

Returns information on HBA ports. The initiator and target **-hba** field returns different information depending on whether you are targeting a Fibre Channel or FCoE or an iSCSI HBA. When you target a Fibre Channel or FCoE HBA, the **-hba** returns the World Wide Name such as: 10:00:00:00:C9:20:DE:0C:10:00:00:00:C9:20:DE:0C. When you target an iSCSI HBA, **-hba** returns the initiator name.

-initiatorcount

Displays the initiator information for each port on a given SP. Lists the number of initiators that are defined, logged in and not logged in.

-mac

Displays the MAC address for the front-end ports of an iSCSI system and also FCoE ports. Running the **port ... -mac** command returns a MAC *Address* field for each port. When you run the **port ... -mac** command, if any ports are Fibre Channel ports, the MAC *Address* field for those ports will display `Not Applicable`.

-physical (CX4 series only)

Displays the physical location of the port including I/O module and physical port information.

-reads

Displays the number of reads for each port.

-sfpstate

Displays the small form factor pluggable (SFP) state for each port. This lets you determine if an incompatible or faulty SFP is detected, in which the status is set to faulted.

-sp

Specifies SP ports only.

-uid *StorageGroupUID*

Specifies the storage group unique ID (also known as the World Wide Name, WWN). If you omit the **-gname** and the **-uid** switches, the CLI describes all HBA ports connected to this storage group.

-usage (CX4 series only)

Indicates how the port is used. For example, when either of the MirrorView enablers is installed, it displays MirrorView.

-prominfo

Displays the new EEPROM information for SFP+ SFPs inserted into the front-end ports.

-unitserialnumber

Specifies the **unitserialnumber** mode.

-writes

Displays the number of writes for each port.

The optional **port -removeHBA** switches are:

-hbauid *hbauid*

Removes a specific initiator record specified with **-hbauid**. *hbauid* specifies a unique host bus adapter identification number (must use uppercase).

-host *hostname*

Removes all initiator records that are logged out and registered, for the specified hostname.

-hostip *IPAdress*

Removes all initiator records that are logged out and registered, for the specified host IP address. You can specify the IP address either as IPv4 or IPv6 address. If an incorrect IP address is specified, an error message appears as follows:

```
The IP address must be specified as an IPv4 address
  in dotted-decimal format or as an IPv6 address in colon-hexadecimal
  notation.
```

Note: If an IPv6 address is specified, EMC recommends that you use a global unicast address.

-all

Removes all initiator records that are logged out and registered, for the specified system.

-o

Executes the command without prompting for confirmation.

EXAMPLE # 1

The following example shows sample output of the **port -list** command targeted to Fibre Channel HBAs and SPs:

Note: The StorageGroup Name field displays `None` if the HBA is not explicitly mapped to a user-defined, a non-user defined, a null, a management, or a physical storage group.

```
naviseccli -h ss1_spa port -list
```

```
Information about each HBA:

HBA UID:
10:10:10:10:10:10:10:10:10:10:10:10:10:10:10:10
Server Name:           matt
Server IP Address:     1.2.3.4
HBA Model Description: ModelABC
HBA Vendor Description:VendorABC
HBA Device Driver Name:N/A
Information about each port of this HBA:
SP Name:            SP A
SP Port ID:         0
HBA Devicename:     N/A
Trusted:            NO
Logged In:          NO
Defined:            YES
Initiator Type:     3
StorageGroup Name: Private

Information about each HBA:

HBA UID:
20:00:00:00:C9:21:FE:D5:10:00:00:00:C9:21:FE:D5
Server Name:
20:00:00:00:C9:21:FE:D5:10:00:00:00:C9:21:FE:D5
Server IP Address:     UNKNOWN
HBA Model Description:
HBA Vendor Description:
HBA Device Driver Name:
Information about each port of this HBA:
SP Name:            SP B
SP Port ID:         0
HBA Devicename:
Trusted:            NO
Logged In:          YES
Source ID:          7280384
Defined:            NO
Initiator Type:     128
StorageGroup Name: None

Information about each HBA:

HBA UID:
AA:01:34:11:22:33:44:44:72:68:01:38:01:21:42:53
Server Name:       dochost.example.com
Server IP Address: 10.10.10.1
HBA Model Description:
HBA Vendor Description:
HBA Device Driver Name:
Information about each port of this HBA:
SP Name:            SP A
SP Port ID:         0
HBA Devicename:
Trusted:            NO
Logged In:          NO
Defined:            YES
Initiator Type:     3
StorageGroup Name: Documentation
SP Name:            SP A
SP Port ID:         1
HBA Devicename:
```

```
Trusted:           NO
Logged In:         NO
Defined:           YES
Initiator Type:    3
StorageGroup Name: Documentation

Information about each HBA:

HBA UID:
20:00:00:00:C9:2B:53:D3:10:00:00:00:C9:2B:53:D3
Server Name:
20:00:00:00:C9:2B:53:D3:10:00:00:00:C9:2B:53:D3
Server IP Address: UNKNOWN
HBA Model Description:
HBA Vendor Description:
HBA Device Driver Name:
Information about each port of this HBA:
SP Name:        SP A
SP Port ID:     0
HBA Devicename:
Trusted:        NO
Logged In:      YES
Source ID:      1315328
Defined:        NO
Initiator Type: 128

Information about each HBA:

HBA UID:
00:11:22:33:44:55:66:77:88:99:AA:BB:CC:DD:EE:FF
Server Name: abc.example.com
Server IP Address: 10.10.10.2
HBA Model Description:
HBA Vendor Description:
HBA Device Driver Name:
Information about each port of this HBA:
SP Name:           SP A
SP Port ID:        0
HBA Devicename:
Trusted:           NO
Logged In:         NO
Defined:           YES
Initiator Type:    3
StorageGroup Name: PublicStorageGroup

Information about each SPPORT:

SP Name:   SP A
SP Port ID:   0
SP UID:   50:06:01:60:BC:E0:0C:12:50:06:01:63:3C:E0:0C:12
Link Status:           Up
Port Status:   Online
Switch Present:   YES
Switch UID:   10:00:00:05:1E:0E:E8:7B:20:1D:00:05:1E:0E:E8:7B
SP Source ID:   859648
I/O Module Slot:   Onboard
Physical Port ID:  2

SP Name:   SP A
SP Port ID:   1
SP UID:   50:06:01:60:BC:E0:0C:12:50:06:01:63:3C:E0:0C:12
Link Status:   Up
```

```
Port Status:   Online
Switch Present:   YES
Switch UID:   10:00:00:05:1E:0E:E8:7B:20:1D:00:05:1E:0E:E8:7B
SP Source ID:   859648
I/O Module Slot:   Onboard
Physical Port ID:   3

SP Name:   SP A
SP Port ID:   2
SP UID:   50:06:01:60:BC:E0:0C:12:50:06:01:63:3C:E0:0C:12
Link Status:   Up
Port Status:   Online
Switch Present:   YES
Switch UID:   10:00:00:05:1E:0E:E8:7B:20:1D:00:05:1E:0E:E8:7B
SP Source ID:   859648
I/O Module Slot:   Onboard
Physical Port ID:  4

SP Name:   SP A
SP Port ID:   3
SP UID:   50:06:01:60:BC:E0:0C:12:50:06:01:68:3C:E0:0C:12
Link Status:   Up
Port Status:   Online
Switch Present:   YES
Switch UID:   10:00:00:05:1E:0E:E8:7B:20:1D:00:05:1E:0E:E8:7B
SP Source ID:   859648
I/O Module Slot:   Onboard
Physical Port ID:  5
```

EXAMPLE # 2

The following example shows sample output of the **`port -list -all`** command targeted to Fibre Channel HBAs and SPs.

```
naviseccli -h ss1_spa port -list -all
```

```
Total number of initiators: 1

SP Name:                  SP A
SP Port ID:               1
Registered Initiators:    0
Logged-In Initiators:     0
Not Logged-In Initiators: 0

SP Name:                  SP A
SP Port ID:               0
Registered Initiators:    0
Logged-In Initiators:     0
Not Logged-In Initiators: 0

SP Name:                  SP B
SP Port ID:               1
Registered Initiators:    0
Logged-In Initiators:     0
Not Logged-In Initiators: 0

SP Name:                  SP B
SP Port ID:               0
Registered Initiators:    1
Logged-In Initiators:     1
Not Logged-In Initiators: 0

SP Name:                  SP A
SP Port ID:               2
Registered Initiators:    0
Logged-In Initiators:     0
Not Logged-In Initiators: 0

SP Name:                  SP A
SP Port ID:               3
Registered Initiators:    0
Logged-In Initiators:     0
Not Logged-In Initiators: 0

SP Name:                  SP B
SP Port ID:               2
Registered Initiators:    0
Logged-In Initiators:     0
Not Logged-In Initiators: 0

SP Name:                  SP B
SP Port ID:               3
Registered Initiators:    0
Logged-In Initiators:     0
Not Logged-In Initiators: 0

Information about each HBA:
HBA UID:
20:00:00:00:C9:5E:B8:FF:10:00:00:00:C9:5E:B8:FF
Server Name:            nlpc46123.us.dg.com
Server IP Address:      10.14.46.123
HBA Model Description:  Emulex LightPulse HBA - Storport
Miniport Driver
HBA Vendor Description: Emulex
HBA Device Driver Name: elxstor
Information about each port of this HBA:
```

```
SP Name:             SP B
SP Port ID:          0
HBA Devicename:      \\.\SCSI3:0:0:0
Trusted:             NO
Logged In:           YES
Source ID:           8327680
Defined:             YES
Initiator Type:      3
StorageGroup Name:   None
ArrayCommPath:       1
Failover mode:       1
Unit serial number: Array
```

EXAMPLE # 3

The following example shows sample output of the **`port -list -hba`** command targeted to an iSCSI HBA.

```
naviseccli -h IPAddress_SP port -list -hba
```

```
Information about each HBA:
HBA UID: iqn.1991-05.com.microsoft:nlpc20234
Server Name:       nlpc20234
Server IP Address: 25.24.23.235
HBA Model Description:
HBA Vendor Description:
HBA Device Driver Name:
Information about each port of this HBA:

SP Name:           SP A
SP Port ID:        0
HBA Devicename:    \\.\SCSI2:0:0:1
Trusted:           NO
Logged In:         YES
Source ID:         4294967295
Defined:           YES
Initiator Type:    3
StorageGroup Name: StorageGrpnlpc20234

Information about each SPPORT:

SP Name:        SP A
SP Port ID:     0
SP UID:         iqn.1992-04.com.emc:cx.apm00034901526.a0
Link Status:    Up
Port Status:    Online
Switch Present: Not Applicable

SP Name:        SP A
SP Port ID:     1
SP UID:         iqn.1992-04.com.emc:cx.apm00034901526.a1
Link Status:    Down
Port Status:    Online
Switch Present: Not Applicable

SP Name:        SP B
SP Port ID:     0
SP UID:         iqn.1992-04.com.emc:cx.apm00034901526.b0
Link Status:    Down
Port Status:    Online
Switch Present: Not Applicable

SP Name:        SP B
SP Port ID:     1
SP UID:         iqn.1992-04.com.emc:cx.apm00034901526.b1
Link Status:    Down
Port Status:    Online
Switch Present: Not Applicable
```

EXAMPLE # 4

The following example shows sample output of the **`port -list -mac`** command targeted to an iSCSI system.

```
naviseccli -h 10.14.80.107 port -list -sp -mac
```

```
Information about each SPPORT:

SP Name:         SP B
SP Port ID:      0
SP UID:          iqn.1992-04.com.emc:cx.apm00034901792.b0
Link Status:     Down
Port Status:     Online
Switch Present: Not Applicable
MAC Address:     00:60:16:01:83:AF

SP Name:         SP B
SP Port ID:      1
SP UID:          iqn.1992-04.com.emc:cx.apm00034901792.b1
Link Status:     Up
Port Status:     Online
Switch Present: Not Applicable
MAC Address:     00:60:16:01:83:B1

SP Name:         SP A
SP Port ID:      0
SP UID:          iqn.1992-04.com.emc:cx.apm00034901792.a0
Link Status:     Down
Port Status:     Online
Switch Present: Not Applicable
MAC Address:     00:60:16:01:82:89

SP Name:         SP A
SP Port ID:      1
SP UID:          iqn.1992-04.com.emc:cx.apm00034901792.a1
Link Status:     Up
Port Status:     Online
Switch Present: Not Applicable
MAC Address:     00:60:16:01:82:8B
```

EXAMPLE # 5

The following example shows sample output of the **`port -list -mac`** command targeted to a Fibre Channel system.

```
naviseccli -h 10.14.5.202 port -list -sp -mac
```

```
Information about each SPPORT:

SP Name:         SP A
SP Port ID:      1
SP UID: 50:06:01:60:90:21:26:3D:50:06:01:61:10:21:26:3D
Link Status:     Up
Port Status:     Online
Switch Present: NO
MAC Address:     Not Applicable

SP Name:         SP A
SP Port ID:      0
SP UID: 50:06:01:60:90:21:26:3D:50:06:01:60:10:21:26:3D
Link Status:     Up
Port Status:     Online
Switch Present: YES
Switch UID:
10:00:08:00:88:60:8E:77:20:0D:08:00:88:60:8E:77
SP Source ID:    7998739
MAC Address:     Not Applicable

SP Name:         SP B
SP Port ID:      1
SP UID: 50:06:01:60:90:21:26:3D:50:06:01:69:10:21:26:3D
Link Status:     Up
Port Status:     Online
Switch Present: NO
MAC Address:     Not Applicable

SP Name:         SP B
SP Port ID:      0
SP UID: 50:06:01:60:90:21:26:3D:50:06:01:68:10:21:26:3D
Link Status:     Up
Port Status:     Online
Switch Present: YES
Switch UID:
10:00:08:00:88:60:8E:77:20:0C:08:00:88:60:8E:77
SP Source ID:    7998483
MAC Address:     Not Applicable
```

EXAMPLE # 6

The following example shows sample output of the **`port -list -mac`** command targeted to a Fibre Channel over Ethernet (FCoE) system that has FC(0,1,2,3), 1G iSCSI(4,5), 10G iSCSI(6,7) and 10G FCoE(8,9) ports.

```
naviseccli -h peregrine-spa port -list -mac
```

```
Information about each SPPORT:
SP Name:             SP B
SP Port ID:          3
MAC Address:         Not Applicable

SP Name:             SP B
SP Port ID:          2
MAC Address:         Not Applicable

SP Name:             SP B
SP Port ID:          0
MAC Address:         Not Applicable

SP Name:             SP B
SP Port ID:          1
MAC Address:         Not Applicable

SP Name:             SP A
SP Port ID:          3
MAC Address:         Not Applicable

SP Name:             SP A
SP Port ID:          2
MAC Address:         Not Applicable

SP Name:             SP A
SP Port ID:          0
MAC Address:         Not Applicable

SP Name:             SP A
SP Port ID:          1
MAC Address:         Not Applicable

SP Name:             SP B
SP Port ID:          4
MAC Address:         00:60:16:1A:3B:C2

SP Name:             SP B
SP Port ID:          5
MAC Address:         00:00:00:00:00:00

SP Name:             SP B
SP Port ID:          6
MAC Address:         00:60:16:32:12:1C

SP Name:             SP B
SP Port ID:          7
MAC Address:         00:00:00:00:00:00

SP Name:             SP A
SP Port ID:          4
MAC Address:         00:60:16:1A:36:52

SP Name:             SP A
SP Port ID:          5
MAC Address:         00:00:00:00:00:00

SP Name:             SP A
SP Port ID:          6
MAC Address:         00:60:16:32:0E:8E
```

```
SP Name:              SP A
SP Port ID:           7
MAC Address:          00:00:00:00:00:00

SP Name:              SP B
SP Port ID:           8
MAC Address:          00:60:16:3B:47:B2

SP Name:              SP B
SP Port ID:           9
MAC Address:          00:60:16:3B:47:B3

SP Name:              SP A
SP Port ID:           8
MAC Address:          00:60:16:3B:55:42

SP Name:              SP A
SP Port ID:           9
MAC Address:          00:60:16:3B:55:43
```

EXAMPLE # 7

The following example shows sample output of the **`port -list -sp -all`** command.

```
SP Name:              SP A
SP Port ID:           9
SP UID:               50:06:01:60:BB:20:13:0D:50:06:01:61:3B:24:13:0D
Link Status:          Up
Port Status:          Online
Switch Present:       YES
Switch UID:           22:9A:00:0D:EC:D3:CF:41:22:9A:00:0D:EC:D3:CF:41
SP Source ID:         0
ALPA Value:           N/A
Speed Value:          10Gbps
Auto Negotiable:      NO
Available Speeds:
10Gbps
Requested Value:      10Gbps
MAC Address:          00:60:16:3B:55:43
SFP State:            Online
Reads:                0
Writes:               0
Blocks Read:          0
Blocks Written:       0
Queue Full/Busy:      0
I/O Module Slot:      4
Physical Port ID:     1
Usage:                General
SFP/Connector EMC Part Number:  019-078-042
SFP/Connector EMC Serial Number:  000000000000000
SFP/Connector Vendor Part Number:  FTLF8528P2BNV-E5
SFP/Connector Vendor Serial Number: PGL4YLY
SFP/Connector Supported Speeds:
2Gbps
4Gbps
8Gbps
```

EXAMPLE # 8

The following example shows sample output of the **port -list -sfpstate** command targeted to FCoE ports, 10G iSCSI, and FC ports.

```
SPF Normal:

SP Name:             SP A
SP Port ID:          11
SP UID:              50:06:01:60:16:21:02:B6:50:06:01:60:16:25:02:B6
Link Status:         Down
Port Status:         DISABLED
Switch Present:      NO
SFP State:           Online


SFP Faulted:

SP Name:             SP A
SP Port ID:          8
SP UID:              50:06:01:60:BB:20:13:0D:50:06:01:68:3B:24:13:0D
Link Status:         Down
Port Status:         DISABLED
Switch Present:      NO
SFP State:           Faulted
```

EXAMPLE # 9

The following example shows sample output of the **port -list -all** command targeted to a CX4 series system.

```
naviseccli -h ss1_spa port -list -sp -all
```

```
Information about each SPPORT:

SP Name:   SP A
SP Port ID:   0
SP UID:   50:06:01:60:BC:E0:0C:12:50:06:01:63:3C:E0:0C:12
Link Status:           Up
Port Status:   Online
Switch Present:   YES
Switch UID:   10:00:00:05:1E:0E:E8:7B:20:1D:00:05:1E:0E:E8:7B
SP Source ID:   859648
I/O Module Slot:   Onboard
Physical Port ID:  2

SP Name:   SP A
SP Port ID:   1
SP UID:   50:06:01:60:BC:E0:0C:12:50:06:01:63:3C:E0:0C:12
Link Status:   Up
Port Status:   Online
Switch Present:   YES
Switch UID:   10:00:00:05:1E:0E:E8:7B:20:1D:00:05:1E:0E:E8:7B
SP Source ID:   859648
I/O Module Slot:   Onboard
Physical Port ID:   3

SP Name:   SP A
SP Port ID:   2
SP UID:   50:06:01:60:BC:E0:0C:12:50:06:01:63:3C:E0:0C:12
Link Status:   Up
Port Status:   Online
Switch Present:   YES
Switch UID:   10:00:00:05:1E:0E:E8:7B:20:1D:00:05:1E:0E:E8:7B
SP Source ID:   859648
I/O Module Slot:   Onboard
Physical Port ID:  4

SP Name:   SP A
SP Port ID:   3
SP UID:   50:06:01:60:BC:E0:0C:12:50:06:01:68:3C:E0:0C:12
Link Status:   Up
Port Status:   Online
Switch Present:   YES
Switch UID:   10:00:00:05:1E:0E:E8:7B:20:1D:00:05:1E:0E:E8:7B
SP Source ID:   859648
I/O Module Slot:   Onboard
Physical Port ID:  5
```

EXAMPLE # 10

The following example shows the output for the **port -list -prominfo** command.

```
Information about each SPPORT:

SP Name:  SP A
SP Port ID:  2
SFP/Connector EMC Part Number:  TBD
SFP/Connector EMC Serial Number:  TBD
SFP/Connector Vendor Part Number:  TBD
SFP/Connector Vendor Serial Number: TBD
SFP/Connector Supported Speeds:
2Gbps
4Gbps
8Gbps

SP Name: SP A
SP Port ID: 3
SFP/Connector EMC Part Number:  TBD
SFP/Connector EMC Serial Number:  TBD
SFP/Connector Vendor Part Number:  TBD
SFP/Connector Vendor Serial Number: TBD
SFP/Connector Supported Speeds:
2Gbps
4Gbps
8Gbps
…
```

powersaving

Enables or disables the power saving settings

PREREQUISITES

For **naviseccli**, you must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **naviseccli powersaving** command allows you to enable or disable power saving settings on a system. It displays the system's idle time and the status of the power saving settings.

SYNTAX

```
naviseccli powersaving -globalsettings [-o] [on|off]
-info [-systemidletime] [-globalpowersavingsettings]
```

OPTIONS

-globalsettings

Enables or disables power saving settings on a system. The system sends a confirmation message only when you specify the **-o** switch.

The following message is displayed, if the settings are turned on:

```
Turning global power saving settings on will spin down all eligible
unused disks and all power saving settings on Storage Pools will take
effect. Do you want to proceed?
```

The following message is displayed, if the settings are turned off:

```
Turning global power saving settings off will allow all drives spinning
up to normal. Do you want to proceed?
```

-info [-systemidletime] [-globalpowersavingsettings]

Displays the system idle time and the status of the global power saving settings.

EXAMPLE

```
naviseccli -h IP address powersaving -info


System Idle Time: 15 min
Global Power Saving Settings: On
```

rebootSP

Reboots an SP

PREREQUISITES

For **naviseccli**, you must have a user account on the system on which you want to execute the command.

DESCRIPTION

This command reboots one or both SPs. If you omit switches, the current SP is rebooted.

Note: If rebootSP is executed while I/O processes are active, I/O errors may occur and/or the Unisphere agent process may hang. If the agent process hangs, you must reboot the host on which the Unisphere agent is running. If you are binding LUNs assigned to one SP, you should not reboot the peer SP until the binding process has completed. Otherwise, until the binding process is completed, you will see error messages each time the SP is polled. If write cache is enabled, rebooting of both SPs is not allowed on CX4 series systems.

Note: See the **rebootpeerSP** command, to reboot the peer SP of the target SP.

SYNTAX

```
rebootSP [-both] [-o]
```

OPTIONS

-both

Reboot both SPs.

-o

Executes the command without prompting for confirmation.

EXAMPLE

```
naviseccli -h ss1_spa rebootSP -both -o
```

rebootpeerSP

Reboots a peer SP

PREREQUISITES

You must have a user account on the system on which you want to execute the command.

DESCRIPTION

Lets you reboot the peer SP of the target SP in a dual-SP system. For the **rebootpeerSP** command, the peer SP is the SP on the system to which the command is not targeted.

Note: See the **rebootSP** command, to reboot the target SP or both SPs on the system.

SYNTAX

rebootpeerSP [**-o**]

OPTIONS

-o

Executes the command without prompting for confirmation.

EXAMPLE

The following example reboots the peer SP of the target SP. The target SP is `ss1_spa`; the peer SP is `ss1_spb`.

```
naviseccli -h ss1_spa rebootpeerSP


This operation will cause a system reboot!
DO YOU WISH TO CONTINUE?  (y/n)?
```

remoteconfig -getconfig

Displays information about a host or SP agent

PREREQUISITES

For **naviseccli**, you must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **remoteconfig** command displays and sets agent configuration information. An agent can be any host agent or SP agent. These commands let you get and set the configuration of the agent running on a remote host, scan all the devices in the system on a remote host, and stop the agent running on a host.

Note: If you are running VMware ESX Server and issuing this command to a virtual machine (VM), it cannot target the host agent because the Unisphere Host Agent is supported only on ESX Server.

The **naviseccli remoteconfig** command with **-getconfig** displays information on the agent running on an SP. To display information on the agent for the specified host, see server -remoteconfig on page 555. If you omit switches, the command displays all agent information. You can request specific information with switches.

To write the agent information to a file, use the **-write** *filename* switch. If you use **-write**, the CLI writes all information to the file; you cannot select specific information with switches. If a file with the same name exists, the CLI will verify to overwrite.

Note: After listing agent information, you can change the agent settings with the **remoteconfig -setconfig** command.

SYNTAX

```
remoteconfig -getconfig [-description] [-contact] [-users] [-interval]
[-write filename]
```

OPTIONS

-description

Displays contents of the description field.

-contact

Displays contents of the contact field.

-users

Displays contents of the users field.

-interval

Displays contents of the polling interval field.

-write *filename*

Writes an image of the configuration file as it exists on the host or SP to file *filename*. The file is written in the same format as the `agent.config` file, which differs from the output of the **getconfig** function without the **-write** switch. You can use this file to set the configuration for other agents using the **remoteconfig setconfig -f** *filename* function. No other switch is allowed with **-write**.

EXAMPLE

This command lists all agent information.

```
naviseccli -h ss1_spa remoteconfig -getconfig
```

OUTPUT

See remoteconfig -getconfig on page 296. If the version of FLARE software running on the SP does not support this command, a `Not supported` error message is printed to stderr. Other errors:

```
RAC_AGENT_NOT_RUNNING
```

remoteconfig -setconfig

Changes configuration information for a host or SP agent

PREREQUISITES

For **naviseccli**, you must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **naviseccli remoteconfig** command with **-setconfig** changes the configuration information for the agent running on an SP. To change configuration information for the agent running on the specified host, see server -remoteconfig on page 555.

Note: The comments in the host agent configuration file are removed. When your changes to the configuration file take effect, comments that previously resided in the file are permanently lost.

The CLI prompts for confirmation of every change you specify unless you use the **-o** (override) or **-f** switch. To change the setting for the agent, enter **y**. The confirmation queries for all settings are as follows.

```
Change host description from old to new <y/n> [y]?

Change contact information from old to new <y/n> [y]?

Add user in the authorized user list <y/n>[y] ?

Remove user from the authorized user list <y/n>[y] ?

Change polling interval to new-interval <y/n>[y] ?
```

To have the CLI obtain the agent information from a file (perhaps a file written with the **getconfig -write** function), use the **-f** *filename* switch. Only the **-o** (override) switch is allowed with the **-f** switch.

You can use the **-getconfig** function to see how settings are formatted. Make sure that your entries are valid for the agent you are configuring. A wrong setting can make an agent inaccessible.

SYNTAX

remoteconfig -setconfig [**-o**] [**-adduser** *userlist*] [**-contact** *contactinfo*] [**-description** *description*] [**-f** *filename*][**-interval** *interval*] [**-rmuser** *userlist*]

OPTIONS

-o

Executes the command without prompting for confirmation.

-adduser *userlist*

Adds the users specified in userlist to the authorized user list. The user name form is `username@hostname`. Separate the user entries with a space.

-contact *contactinfo*

Specifies new contact information for the agent description field.

-description *description*

Specifies new contents for the agent description field.

-f *filename* **(Not supported on AX series)**

Reads the configuration information from file `filename`. This file must be in the correct format (same as the agent configuration file used in earlier Navisphere revisions). The **-getconfig -write** command automatically creates files in the correct format. When you use **-f**, the CLI does not prompt for confirmation; the **-o** switch is not needed.

-interval *interval*

Changes the polling interval in seconds to *interval*. The valid range is 1 to 120. This switch may not apply to all system types.

-rmuser *userlist*

Removes the specified users from the authorized user list.

EXAMPLE

This command adds the user `tsjones` on host `viking` to the agent privileged users list.

```
naviseccli -h ss1_spa remoteconfig -setconfig -adduser
tsjones@viking

Add tsjones@viking in the authorized user list <y/n>[y]?
```

OUTPUT

See remoteconfig -getconfig on page 296. If the version of FLARE software running on the SP does not support this command, a `Not supported` error message is printed to `stderr`. Other errors:

```
RAC_AGENT_NOT_RUNNING RAC_REMOTECONFIG_NOT_SUPPORTED

INVALID_MEGAPOLL
```

```
INVALID_USEEXPLICITDEVNAME

RAC_FILE_NOT_FOUND
```

removerg

Removes a RAID group

PREREQUISITES

For **naviseccli**, you must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **naviseccli removerg** command removes a specified RAID group.

Note: This command cannot remove thin pools.

SYNTAX

removerg *rgID*

OPTIONS

rgID

RAID group identification number. *rgID* specifies a number between 0 and the maximum number of RAID groups supported by the RAID group system.

EXAMPLE

This command removes RAID group 1.

```
naviseccli -h ss1_spa removerg 1
```

resetandhold

Resets an SP and holds the reboot following the power on self tests (POST)

PREREQUISITES

You must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **naviseccli resetandhold** command, resets an SP and holds the reboot following the power on self tests (POST), to allow an SP to be reset in a safe manner for systems where pulling and reseating the SP is not permitted during operation. Because the boot process is held, a subsequent **rebootpeerSP** command must be issued to clear the hold and reboot the SP, to return the SP to service.

Note: Issue **rebootpeerSP** after you issue **resetandhold**, when you are ready to return the SP to service.

SYNTAX

resetandhold

EXAMPLE

The following example resets and holds the reboot for the targeted SP on the system.

```
naviseccli -h ss1_spa resetandhold

This operation will cause the system to reset and
then hold the reboot process following the Power On Self
Tests (POST). To clear the hold state and complete the SP reboot,
a rebootpeersp command must be issued to the peer SP.

DO YOU WISH TO CONTINUE?  (y/n)?
```

responsetest

Tests Event Monitor response

PREREQUISITES

For **naviseccli**, you must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **naviseccli responstest** command creates an artificial event to test event monitor response.

The **responsetest** command is designed for use without the event monitor User Interface (UI). That is, you can use responsetest in conjunction with the event monitor template file, `navimon.cfg`, which you can edit to specify the event monitor responses you want. If you have used the event monitor UI to set up an event monitor template, do not use this command.

Event monitor functions accessed via **responsetest** are decentralized, providing email and pager support from local systems only. The EMC phone home feature is not available via this command.

SYNTAX

responsetest -email *response-parameters*| **-emailpage** *response-parameters* |
-modempage *response-parameters* |
-snmp *response-parameters*

OPTIONS

response-parameters

Allows different parameters for each type of response you specify, as follows:

-email

-smtpmailserver *smtpmailserver_hostname*

Specifies the SMTP mail server; required.

-destaddress *destination_email_address*

Specifies the destination email address; required.

[-subject *"text"***]**

The *text*, within quotation marks, specifies the subject of the email; optional.

[-cc *destination_email_address***]**

The email address to send a cc (copy) to; optional.

[-message *"text"* **| -file** *filename***]**

The text, in quotation marks, describes the event; optional. Or you specify a file with descriptive text using **-file.**

[-sender *sender_email_address***]**

Specifies the sender address; optional. If omitted, CLI inserts the agent hostname as the *sender_email_address*.

-emailpage

-smtpmailserver *smtpmailserver_hostname*

Specifies the SMTP mail server; required.

-destaddress *destination_email_address*

Specifies the destination email address; required.

[-subject *"text"* **]**

The *text*, within quotation marks, specifies the subject of the email; optional.

[-cc *destination_email_address***]**

The email address to send a cc (copy) to;

[-message *"text"* **| -file** *filename***]**

The *text*, in quotation marks, describes the event; optional. Or you specify a file with descriptive text using **-file.**

[-sender *sender_email_address***]**

Specifies the sender address; optional. If omitted, CLI inserts the agent hostname as the *sender_email_address*.

-modempage

(Not supported on AX4-5 series and AX series)

-destnumber *phone-number*

Specifies the pager phone number (with area code) and is required.

-msgnumber *phone-number*

Specifies the number that will appear on the pager display (with area code).

[-comport *number* **]**

Specifies the *number* of the PC COM. If omitted, the CLI assumes COM l; optional.

[-messagedelay *seconds* **]**

Specifies the delay between sending the destination phone number to the modem and sending the message to the modem. This allows enough time for the receiving modem to answer the call. Optional.

[-dialcommand *command***]**

Specifies the modem dial command to be used by the agent. Optional.

[-initcommand *command-to-modem* **]**

Specifies the modem dial command to be used by the agent. The **initcommand** allows for some custom modem configuration before the data is sent to it. Optional.

-community *community*

Specifies a community on the snmp managment host; optional.

-desthost *destination-hostname*

Specifies an snmp management hostname; required.

-device *device*

Specifies the device represented by the snmp management host. Required.

EXAMPLE

This command sends a modem page test event.

```
naviseccli -h ss1_spa responsetest  modempage -destnumber
-msgnumber
```

OUTPUT

Result of the test.

sc_off

Disables data access control

PREREQUISITES

For **naviseccli**, you must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **naviseccli sc_off** command disables data access control and turns off shared storage features. You can use this command to reset the system to its factory unshared storage settings.

CAUTION Be aware that executing **sc_off** resets the system to its factory unshared storage settings, permanently destroying all previously implemented shared storage features.

SYNTAX

```
sc_off [-o]
```

OPTIONS

-o

Executes the command without prompting for confirmation.

EXAMPLE

```
naviseccli -h ss1_spa sc_off
```

OUTPUT

The first time you run the **sc_off** command, you will see an output similar to the following:

```
You have asked to remove all shared storage components
from the indicated system.

The following functions will be performed, if necessary:
Clear the system's password
Turn fairness off
Set the default storage group to ~physical
Remove all initiator records
Remove all user defined storage groups
Do you wish to proceed? (y/n)? y

Clearing the system's password
Old Password: ***
Turning fairness off
Setting the default storage group to ~physical
Removing all initiator records
Removing all user defined storage groups

If you run the command a second time, and the first time
through completed successfully, the output will be as
follows:

You have asked to remove all shared storage components
from the indicated system.

The following functions will be performed, if necessary:
Clear the system's password
Turn fairness off
Set the default storage group to ~physical
Remove all initiator records
Remove all user defined storage groups
Do you wish to proceed? (y/n)? y
```

setcache

Sets SP cache or RAID 3 size information

PREREQUISITES

For **naviseccli**, you must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **naviseccli setcache** command changes system caching or RAID 3 settings on an SP. By using **setcache** with its various switches, you can enable, disable, and configure the cache. Cache size switches do not affect a cache if that cache is enabled; you must disable the pertinent cache (**-rc** or **-wc** switches) before any size switches will be effective.

Note: The changes to caching properties may be delayed until you have allocated memory and the standby power supply (SPS) is working. This may take several minutes.

Note: You can use the **getsp** command to discover SP memory and the **getcache** command to discover cache settings.

SYNTAX

setcache [**-h** *highwatermark*] [**-hacv** *n*] [**-l** *lowwatermark*] [**-p** *page-size*] [**-r3a** *raid3sizespa*] [**-r3b** *raid3sizespb*]
[**-rsza** *readcachesizespa*] [**-rszb** *readcachesizespb*]
[**-rca** *readcachespa*] [**-rcb** *readcachespb*]
[**-wc** *writecache*] [**-wsz** *writecachesize*] [**-o**]

OPTIONS

-h *high-watermark* **(not supported on a single-SP AX4-5 series system running Unisphere)**

Sets the write cache high watermark. *highwatermark* specifies the percentage of dirty pages, which, when reached, causes both SPs to begin flushing the cache. The default is 80 percent for CX3 series and CX series.

A lower value causes the SPs to start flushing the cache sooner. The high watermark cannot be less than the low watermark. To turn watermark processing off, set both the low and high watermark values to 100.

-hacv *n* **(not supported on a single-SP AX4-5 series system running Unisphere and on CX4 series systems)**

Enables or disables the HA cache vault. *n* is as follows:

1	Enables HA cache vault (the default)
0	Disables HA cache vault

If you set **-hacv** to a value other than 0 or 1, an error message appears. If you enable the HA cache vault, a single drive failure will cause the write cache to become disabled, thus reducing the risk of losing data in the event of a second drive failing. If you disable the HA cache vault, a single drive failure does not disable the write cache, leaving data at risk if a second drive fails. When you disable the HA cache vault, you will receive a warning message stating that this operation will allow write caching to continue even if one of the cache vault drives fails. If there is already a failure on one of the cache vault drives, this operation will not re-enable the write cache.

-l *low-watermark* **(not supported on a single-SP AX4-5 series system running Unisphere)**

Sets the write cache low watermark. *low-watermark* specifies the percentage of cache dirty pages that determines when cache flushing stops. When the low watermark is reached during a flush operation, both SPs stop flushing the cache. The default is 60 percent for CX3 series and CX series. The low watermark cannot be greater than the high watermark. To turn watermark processing off, set both the low and high watermark values to 100.

-p *page-size*

Sets, in KB, the page size for the caches. Valid sizes are 2, 4, 8, and 16. The default is 2. Page size is set to 2 regardless of enable/disable. As a general guideline, the cache page size should be 8 KB for general UNIX file server applications, and 2 KB or 4 KB for database applications. It does not work if the read or write cache is enabled.

Note: Setting a page size, RAID 3 size, or write cache size for one SP automatically sets the other to the same size, so you need only specify a size for one SP.

-r3a *raid3-size-spa* **(not supported on an AX4-5 series system running Unisphere)**

For a non-4700 system: Sets the SP memory size, in MB, reserved for RAID 3 in SP A (and SP B). *raid3-size-spa* specifies the size. This size must be the sum of the memory allocated for all RAID 3 LUNs to be bound. For example, if you bind two RAID 3 LUNs, each with the recommended 6 MB of memory, you must set this field to 12 (6 + 6). If the system does not have any RAID 3 LUNs, this value should be 0.

For a CX3 series or CX series, RAID 3 memory is allocated automatically; you cannot set it.

-r3b *raid3-size-spb* **(not supported on an AX4-5 series system running Unisphere)**

Sets the optimum RAID 3 size for SP B (and SP A). See comments for **-r3a** above.

-rsza *read-cache-size-spa*

Sets the read cache size for SP A to *read-cache-size-spa* MB.

Note: For read/write caching to function, the total size allocated to the read and write caches (together) must be at least 4 MB (for CX3 series and CX series systems).

-rszb *read-cache-size-spb* **(not supported on a single-SP AX4-5 series system running Unisphere)**

Sets the read cache size for SP B to *read-cache-size-spb* MB.

-rca *read-cache-spa*

Enables or disables the read cache function for SP A. For *read-cache-spa*:

0	Disables read cache
1	Enables read cache

-rcb *read-cache-spb* **(not supported on a single-SP AX4-5 series system running Unisphere)**

Enables or disables the read cache function for SP B. For *read-cache-spb*:

0	Disables read cache
1	Enables read cache

-wc *write-cache* **(not supported on a single-SP AX4-5 series system running Unisphere)**

Enables or disables the write cache function. For *write-cache*:

0	Disables write cache
1	Enables write cache

-wsz *write-cache-size-sp* **(not supported on a single-SP AX4-5 series system running Unisphere)**

Sets the write cache size for the system to *write-cache-size-sp* MB. Also, see the note on sizes under **-rsza**.

EXAMPLE # 1

The **getsp -mem** command gets SP memory information. Each SP has the same amount of memory, so you need not issue this command for SP B.

```
naviseccli -h ss1_spa getsp   -mem

Memory Size For The SP: 930
```

EXAMPLE # 2

This command sets the write cache (applies to both SPs) to 650 MB, enables write caching, sets a write cache page size of 8 KB, sets a read cache size for each SP of 280 MB, and enables read caching.

```
naviseccli -h ss1_spa setcache -wsz 650 -wc 1
 -p 8 -rcza 280 -rczb 280 -rc 1
```

setfeature

Adds a software feature to a LUN controlled by an SP

PREREQUISITES

For **naviseccli**, you must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **naviseccli setfeature** command adds and removes a software driver feature to a LUN owned by an SP.

SYNTAX

setfeature -on|-off -feature *feature* **-lun** *lun*| **-lunuid** *uid*

OPTIONS

-on or -off

Adds or removes the feature.

-feature *feature*

Identifies the feature; for example, RM for remote mirroring and sancopy for SAN Copy.

-lun *lun* **or -lunuid** *uid*

Specifies the LUN. You can use the LUN number or the LUN unique ID, UID (which is the World Wide Name, WWN).

OUTPUT

If the version of FLARE software running on the SP does not support this command, a `Not supported` error message is printed to stderr. Other errors:

`COMMAND_NOT_SUPPORTED`

`FEATURE_REQUIRED`

`LUN_AND_LUNUID_SPECIFIED`

setsniffer

Starts a background verify process or changes verify process parameters

PREREQUISITES

For **naviseccli**, you must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **naviseccli setsniffer** command starts a background verify process or changes the parameters for the verify process. You can indicate a specific LUN, all LUNs in a RAID group, or all LUNs in a system.

Note: The **setsniffer** command does not support thin LUNs.

SYNTAX

setsniffer **-all**|*lun*|**-rg** *raidgroupnumber* [**-bv**] [**-bvtime** *priority*] [**-cr**]

OPTIONS

-all

Applies sniffer parameters to all LUNs in the system. The target SP must own one LUN at minimum.

lun

Applies sniffer parameters to the specified LUN. *lun* specifies the logical unit number. You must target the SP that owns the specified LUN.

-rg *raidgroupnumber*

Applies sniffer parameters to all LUNs in the specified RAID group.

-bv

Starts a full unit background verify.

-bvtime *priority*

Specifies the background verify priority. *priority* specifies the priority value (the rate at which the full background verify is executed). Valid values are ASAP, High, Medium, and Low.

-cr

Clears background verify reports.

EXAMPLE

Starts a background verify on LUN 0 and sets the verify priority to high.

```
naviseccli -h ss1_spa setsniffer 0 -bv -bvtime high
```

OUTPUT

There is no output. Errors are printed to stderr.

setspstime

Sets SPS or BBU battery test time

PREREQUISITES

For **naviseccli**, you must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **naviseccli setspstime** command sets the SPS battery test time. If no switches are specified, the command returns the current SPS battery test time. The SPS test time is displayed for the client's time zone.

Note: For AX4-5 series systems, the battery test time on the peer SPS is set to the time you are setting for the current SPS, with an offset of approximately 20 minutes.

SYNTAX

setspstime [**-d** *day-num*] [**-h** *hour-num*] [**-m** *minute-num*] [**-nolocal**]

OPTIONS

-d *day-num*

Sets the day of the week (0-6, 0=Sunday).

-h *hour-num*

Sets the hour of the day (0-23, 0=12:00 AM).

-m *minute-num*

Sets the minute of the hour (0-59).

Note: To set the SPS or BBU test time, all switches must be specified.

-nolocal

The SPS test time is displayed for the client's time zone.

Note: **-nolocal** is required if your system is communicating with a host agent version less than 6.5. You cannot use this switch with version 6.5 or higher.

EXAMPLE

This example sets the SPS battery test time to Sunday at 1:00 AM.

```
naviseccli -h ss1_spa setspstime -d 0 -h 1 -m 0
```

OUTPUT

There is no output. Errors are printed to stderr.

setsptime

Sets the SP system clocks

PREREQUISITES

For **naviseccli**, you must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **naviseccli setsptime** command sets the system time for both SPs.

SYNTAX

setsptime [**-M** *month-num*] [**-D** *day-num*] [**-Y** *year-num*] [**-h** *hour-num*] [**-m** *minute-num*]

OPTIONS

-M *month-num*

Specifies the month (1-12).

-D *day-num*

Specifies the day (1-31).

-Y *year-num*

Specifies the year; use four digits.

-h *hour-num*

Specifies the hour (0-23).

-m *minute-num*

Specifies the minute (0-59).

EXAMPLE

This example sets the SP system clock to March 13, 2002, 9:00 am.

```
naviseccli -h data1_spa setsptime -M 3 -D 13 -Y 2002 -h 9
```

OUTPUT

There is no output. Errors are printed to stderr.

setstats

Sets statistics logging

PREREQUISITES

For **naviseccli**, you must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **naviseccli setstats** command sets statistics logging. If no optional switches are present, the command returns the current state of statistics logging. The SP maintains a log of statistics for the LUNs, disk modules, and system caching that you can turn on and off. When enabled, logging affects system performance, so you may want to leave it disabled unless you have a reason to monitor performance.

The log uses a 32-bit counter to maintain the statistics numbers. When the counter is full, the statistics numbers restart at zero. As a result, you will see a sudden decrease in a statistics number if you view it shortly before the counter is full and shortly after the counter restarts at zero. If you want to keep the log turned on for more than two weeks, we recommend that you reset the log about every two weeks, so you know when the numbers start at zero.

The command affects only the SP you specify.

SYNTAX

```
naviseccli setstats -on|-off [-powersavings] [-on|-off]
```

OPTIONS

setstats -on|-off

Enables/disables the performance statistics logging.

Note: If statistics logging is off, certain options in other commands are disabled. The options for the other commands specify whether statistics logging must be on for their options to be valid.

-powersavings

Enables/disables the disk spin-down statistics logging. It affects only the disk spin-down statistics.

-on|-off

Returns the current state of power saving statistics logging.

EXAMPLE

The sample output is as follows:

```
naviseccli -h ss1_spa setstats -on

naviseccli -h ss1_spa setstats -powersavings

Disk Spin Down statistics logging is DISABLED
OR
Disk Spin Down statistics logging is ENABLED
Start Power Savings Log Timestamp: xx/xx/xxxx xx:xx:xx
```

OUTPUT

There is no output. Errors are printed to stderr.

shutdown

Shuts down and powers off the system

PREREQUISITES

For **naviseccli**, you must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **naviseccli shutdown** command shuts down and powers off the system you specify.

SYNTAX

shutdown [**-o**]

OPTIONS

-o

Executes the command without prompting for confirmation.

EXAMPLE

This command shuts down and powers off the specified system.

```
naviseccli -h ss1_spa shutdown

Before you shutdown the system, stop all I/O from
any servers connected to the system and save all
unsaved data to disk.  During the shutdown process you
will lose access to all data on the LUNs but you will not
lose any data.  When you power up the system you
will regain access to the LUNs.

Do you want to shutdown and power off the subsystem now
(y/n)?
```

OUTPUT

None if the command succeeds; status or error information if it fails.

shutdownsp

Shuts down and powers off the current SP

PREREQUISITES

For **naviseccli**, you must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **naviseccli shutdownsp** command shuts down the current storage processor (SP) of the system.

SYNTAX

shutdownsp [**-o**]

OPTIONS

-o

Executes the command without prompting for confirmation. The confirmation message varies depending on the system.

EXAMPLE # 1

This command shuts down and powers off the current storage processor (SP). The confirmation message for AX4-5 series system is as follows:

```
naviseccli -h ss1_spa shutdownsp

This operation will shutdown and power off the SP.

To reconnect please reboot the SP or manually power up by
pushing the power button on the system. Before you shut
down the SP, first verify that each server has failover
software and has a working path to a port on both SPA and
SPB.  If you do not, stop I/O from the server(s) without
a path to each SP, to prevent losing access to your data.

Do you want to shutdown and power off the SP now? (y/n)?
```

EXAMPLE # 2

The confirmation message for CX4 series system is as follows:

```
naviseccli -h ss1_spa shutdownsp
```

```
This operation will power off the SP.

To reconnect please reboot the SP - this can be accomplished
by using the rebootpeerSP command.

Do you want to shutdown and power off the SP now? (y/n)?
```

EXAMPLE # 3

The confirmation message for a VNX5300 Block or VNX5500 Block system is as follows:

```
This operation will shutdown the SP and hold it in reset.

To reconnect please reboot the SP - this can be accomplished by using the
rebootpeerSP command.

Do you want to shutdown and hold the SP now? (y/n)?
```

OUTPUT

None if the command succeeds; error information if used with any other system.

shutdownpeersp

Shuts down and powers off the peer SP

PREREQUISITES

For **naviseccli**, you must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **naviseccli shutdownpeersp** command shuts down the peer storage processor (SP).

SYNTAX

shutdownpeersp [**-o**]

OPTIONS

-o

Executes the command without prompting for confirmation.

The confirmation message varies depending on the system.

EXAMPLE # 1

This command shuts down and powers off the specified peer SP. The confirmation message for AX4-5 series system is as follows:

```
naviseccli -h ss1_spa shutdownpeersp

This operation will shutdown and power off the SP.

To reconnect please reboot the SP or manually power up by
pushing the power button on the system.  Before you shut
down the SP, first verify that each server has failover
software and has a working path to a port on both SPA and
SPB.  If you do not, stop I/O from the server(s) without a
path to each SP, to prevent losing access to your data.

Do you want to shutdown and power off the SP now? (y/n)?
```

EXAMPLE # 2

The confirmation message for CX4 series system is as follows:

```
naviseccli -h ss1_spa shutdownpeersp
```

```
This operation will power off the SP.
To reconnect please reboot the SP - this can be accomplished
by using the rebootpeerSP command.

Do you want to shutdown and power off the SP now? (y/n)?
```

EXAMPLE # 3

The confirmation message for a VNX5300 Block or VNX5500 Block system is as follows:

```
This operation will shutdown the SP and hold it in reset.

To reconnect please reboot the SP - this can be accomplished by using the
rebootpeerSP command.

Do you want to shutdown and hold the SP now? (y/n)?
```

OUTPUT

None if the command succeeds; error information if used with any other system.

spcollect -info

Displays the setting of the automated SPCollect service

PREREQUISITES

You must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **naviseccli spcollect** command with the **-info** function lets you display the setting of the automated SPCollect functionality. The setting appears as *Enabled* when the SPCollect automated functionality is turned on; *Disabled* when it is turned off.

The automated SPCollect service is part of the `Peerwatch` service included with FLARE Operating Environment version 02.19.xxx.5.yyy or higher.

SYNTAX

```
spcollect -info
```

EXAMPLE

This command shows you the setting of the automated SPCollect functionality for the specified system. The *Enabled* setting, indicating that the SPCollect process is turned on, appears in the output above.

```
naviseccli -address ss\1_spa spcollect -info
```

OUTPUT

```
AutoExecution: Enabled
```

spcollect -set

Sets the automated SPCollect service on or off

PREREQUISITES

You must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **naviseccli spcollect** command with the **-set** function lets you set the automated SPCollect process on or off.

The automated SPCollect service is part of the `Peerwatch` service included with FLARE Operating Environment version 02.19.xxx.5.yyy or higher.

Note: Use **spcollect -info** to verify whether the service is enabled or disabled.

SYNTAX

spcollect -set -auto *on|off* [**-o**]

OPTIONS

-auto *on|off*

Sets the automated SPCollect process on or off. If you indicate *on*, it turns the automation service on; if you indicate *off*, it turns the automation service off.

-o

Executes the command without prompting for confirmation.

EXAMPLE

This command turns the automated SPCollect process on.

```
naviseccli -address ss1_spa spcollect -set -auto on
```

OUTPUT

None if the command succeeds; status or error information if it fails.

spcollect

Selects and places a collection of system log files into a single .zip file

PREREQUISITES

For **naviseccli**, you must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **naviseccli spcollect** command selects a collection of system log files and places them in a single .zip file on the system. You can retrieve the file from the system using the **managefiles** command.

Note: This command is not related to the automated SPCollect service that is part of the Peerwatch service included with FLARE Operating Environment version 02.19.xxx.5.yyy or higher. This command lets you run the SPCollect functionality separate from the scheduled service. See the **spcollect -set** command to enable or disable the automated SPCollect service.

Important: The SPCollect functionality can affect system performance (may degrade system performance).

SYNTAX

spcollect

EXAMPLE

This example creates a .zip file on the system, which contains system log files. The .zip file has the following format:
`arrayserialnumber_SPx_date_time_spsignature_data.zip`

```
naviseccli -h ss1_spa spcollect
```

arrayserialnumber Is the system serial number.

x Is SP A or B.

date Is the date of collection.

time Is the time of collection.

spsignature Is the SP signature

OUTPUT

There is no output. Errors are printed to stderr.

spportspeed

Set or get the SP port speed

PREREQUISITES

For **naviseccli**, you must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **naviseccli spportspeed** command gets or sets the SP port speed. You can set the port speed on either SP directly or through the other SP. The port speed you can set and the options available depend upon your system type.

For a port speed to work, the HBA, switch, and SP must all support it. You can set the ports of an SP to different speeds if the ports connect to switches or HBAs with different speeds.

⚠ CAUTION Incompatible port speeds will prevent the two devices from communicating. The CLI prompts for confirmation as follows before executing the **-set** command.

```
 Changing the port speed is a disruptive function.
  Verify that the other device connected to the system, supports the new
speed.
  If the speed settings are incompatible, the system will be unable to
  communicate with the other connected device. Are you sure you want to
change
  speed of SP x Port n from n Gigabit to n Gigabit <y/n>?
```

SYNTAX

```
spportspeed -get [-isauto] [-avail] [-requested] [-type] [-physical]
```

OPTIONS

-isauto

Indicates whether the Auto-Negotiate feature is turned on or off. The CLI returns a yes value if the feature is turned on, a no value if the feature is turned off, and a not supported value if the feature is not supported.

Note: If you have the Auto-Negotiate feature turned on, the Speed Value that is generated in the output does not have a value of auto. The value reflects the speed at which the port is currently operating. If you have the Auto-Negotiate feature turned on and you specify the **-requested** switch, the Requested Value displays a value of auto.

-avail

Indicates the available speeds for a specified port.

-requested

Displays the speed requested through **spportspeed -set**. The speed that is requested may not equal the actual speed of the port. For example when the Auto-Negotiate feature is turned on, the Requested Value displays auto and the Speed Value displays the speed at which the port is currently operating.

-type

Displays the connection type (Fibre Channel or iSCSI) for each port along with the speeds.

-physical (CX4 series only)

Displays the physical location of the port.

or

spportspeed -set -sp *sp* **-portid** *port speed*

Note: If an incompatible small form factor pluggable (SFP) is detected, the port is faulted and you will not be able to set the SP port speed.

---

where:

-sp *sp*

Specifies the SP on which to set the port speed (**a**|**b**).

-portid *port speed*

port specifies the port on the SP (0, 1, 2, or 3).

speed specifies the port speed: See the note above. For Fibre Channel systems, port speed is 1 for 1 Gb mode, 2 for 2 Gb mode, 4 for 4 Gb mode, auto to initiate the Auto-Negotiate feature. For iSCSI systems, port speed is 10 for 10 Mb mode, 100 for 100 Mb mode, 1000 for 1000 Mb mode, auto to initiate the Auto-Negotiate feature.

EXAMPLE # 1

```
naviseccli -h ss1__spa spportspeed -get -physical
```

```
Storage Processor :  SP A
Port ID :   0
Speed Value :   8Gbps
Auto Negotiable :  Yes
Available Speeds:
2Gbps
4Gbps
8Gbps
Auto
Requested Value:  Auto
Connection Type:  Fibre Channel
I/O Module Slot:   Onboard
Physical Port ID:  2
SFP Supported Speeds:
2Gbps
4Gbps
8Gbps

Storage Processor :  SP A
Port ID :   1
Speed Value :   8Gbps
Auto Negotiable :  Yes
Available Speeds:
2Gbps
4Gbps
8Gbps
Auto
Requested Value:  Auto
Connection Type:  Fibre Channel
I/O Module Slot:   Onboard
Physical Port ID:  3
SFP Supported Speeds:
2Gbps
4Gbps
8Gbps

Storage Processor :  SP A
Port ID :   2
Speed Value :   8Gbps
Auto Negotiable :  Yes
Available Speeds:
2Gbps
4Gbps
8Gbps
Auto
Requested Value:  Auto
Connection Type:  Fibre Channel
I/O Module Slot:   Onboard
Physical Port ID:  4
SFP Supported Speeds:
2Gbps
4Gbps
8Gbps

Storage Processor :  SP A
Port ID :   3
Speed Value :   8Gbps
Auto Negotiable :  Yes
Available Speeds:
2Gbps
4Gbps
```

```
8Gbps
Auto
Requested Value:  Auto
Connection Type:  Fibre Channel
I/O Module Slot:   Onboard
Physical Port ID:  5
SFP Supported Speeds:
2Gbps
4Gbps
8Gbps
```

EXAMPLE # 2

```
naviseccli -h ss1_spa spportspeed -set -sp a -portid 0 2


Changing the port speed is a disruptive function. Verify
that the other device connected to the system,
supports the new speed. If the speed settings are
incompatible, the system will be unable to
communicate with the other connected device.

Are you sure you want to change speed of SP A Port n from
1 Gigabit to 2 Gigabit <y/n>? y
```

OUTPUT

If the version of FLARE software running on the SP does not support this command, a `Not supported` error message is printed to stderr.

storagegroup

Creates and configures storage groups

PREREQUISITES

For **naviseccli**, you must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **naviseccli storagegroup** command lets you create and manage shared systems, that is, systems that use storage groups and have the storage group option. For most command operations, the CLI prompts for confirmation unless you use the **-o** switch.

You can use the CLI command **storagegroup -connecthost** to assign a storage group to all HBAs in a host, or the command **storagegroup -setpath** to assign a storage group to a specific HBA in a host. To change the settings of a storage group that is already assigned, use the command **storagegroup -sethost**. To disconnect a host from all its storage groups, use **storagegroup -disconnecthost**.

The **storagegroup** command has many switches, some of which have functions that you also indicate with switches.

SYNTAX

```
storagegroup [-addhlu switches] |
[-addsnapshot switches] |
[-chgname switches] |
[-connecthost switches] |
[-create switch] |
[-destroy switch]|
[-disconnecthost switch] |
[-enable] |
[-list switches] |
[-removehlu switches] |
[-removesnapshot switches] |
[-sethost switches] |
[-setpath switches] |
[-shareable switch] |
```

OPTIONS

storagegroup command, -addhlu switch -addhlu -gname *StorageGroupName*| **-uid** *StorageGroupUID* **-hlu** *hlunumber* **-alu** *alunumber*

Adds a host LUN to a storage group. This command requires a bound LUN. If required, use the **bind** command to create a LUN. You must use **-gname** or **-uid** and two other switches with **-addhlu** as follows. Also, see the example in unbind on page 352.

-gname *StorageGroupName*
Specifies the name of the storage group.

-uid *StorageGroupUID*
Specifies the storage group unique identification number.

For Fibre Channel systems, the UID uses the World Wide Name (WWN) format such as: 10:00:00:00:C9:20:DE:0C:10:00:00:00:C9:20:DE:0C.

For iSCSI systems, the UID uses the initiator name which uses the IQN format such as: iqn.1992-04.com.emc:cx.apm00034901792.b0.

-hlu *hlunumber*
Specifies the host LUN number, which is the number that the system server will see. *hlunumber* is the virtual LUN number. (Virtual LUN numbers let a host whose operating system has LUN limit or LUN booting restrictions use a number other than the actual system LUN ID (**-alu** below), which might be out of the operating system's range, to access a LUN.) This switch is required along with **-alu** and either the**-gname** or **-uid** switch.

If you have not assigned a host LUN number of 0 and if the **arraycommpath** setting is 1, then after the bus is rescanned, the system will display an entry for LUN 0 even though you have not assigned a host LUN 0. This occurs because the **arraycommpath** setting of 1 creates a virtual LUN 0 for communication with the system.

-alu *alunumber*
Specifies the system LUN number, the actual LUN number internal to the system. This is the number assigned when the LUN was bound. *alunumber* specifies the logical unit number. This switch is required along with **-hlu** and either the **-gname** or **-uid** switch.

storagegroup command, -addsnapshot switch -addsnapshot -gname *StorageGroupName* | **-uid** *StorageGroupUID* **-hlu** *hlunumber* **-snapshotname** *snapshotname* | **-snapshotuid** *snapshotuid*

Adds a snapshot to a storage group. The storage group you choose should be different from the source LUN storage group. You must use three of the following switches with **-addsnapshot**:

-gname *StorageGroupName*	Sets the name of the storage group. *StorageGroupName* specifies a user-defined storage group name; or
-uid *StorageGroupUID*	Specifies the storage group unique identification number. For Fibre Channel systems, the UID uses the World Wide Name (WWN) format such as: 10:00:00:00:C9:20:DE:0C:10:00:00:00:C9:20:DE:0C. For iSCSI systems, the UID uses the initiator name which uses the IQN format such as: iqn.1992-04.com.emc:cx.apm00034901792.b0.
-hlu *hlunumber*	Specifies the host LUN number for the snapshot, which is the unique number that the system server will see. *hlunumber* is the virtual LUN number.
-snapshotname *snapshotname* | **-snapshotuid** *snapshotuid*	Specifies the snapshot name or unique ID number (World Wide Name, WWN). One of these switches is required along with the **-gname** or **-uid** switch.

storagegroup command, -chgname switch -chgname -gname *StorageGroupName* | **-uid** *StorageGroupUID* **-newgname** *NewName* **[-o]**

Renames the storage group. You must use two of the following switches with **-chgname**:

-gname *StorageGroupName*	Specifies the name of the storage group. *StorageGroupName* specifies a user-defined storage group name.
-uid *StorageGroupUID*	Specifies the storage group unique identification number. For Fibre Channel systems, the UID uses the World Wide Name (WWN) format such as: 10:00:00:00:C9:20:DE:0C:10:00:00:00:C9:20:DE:0C. For iSCSI systems, the UID uses the initiator name which uses the IQN format such as: iqn.1992-04.com.emc:cx.apm00034901792.b0.
-newgname *NewName*	Sets the new storage group name for the storage group (specified by the **-gname** or **-uid** switch). *NewName* specifies the new name for the specified storage group.
-o	Executes the command without prompting for confirmation.

storagegroup command, -connecthost switch -connecthost -host *HostName* **-gname** *StorageGroupName* **| -uid** *StorageGroupUID* **[-o]**

Connects the specified host to the specified storage group. It connects all of the host's HBA/SP combinations to the storage group by assigning the host's initiator records to the storage group. To assign a storage group to a specific HBA, use **storagegroup -setpath**.

You may use the **port -list** command to get a list of registered HBAs. If nothing is registered, use the **navicli register** command to register an HBA.

You must specify the host using the **-host** switch, and the storage group using the **-gname** switch or the **-uid** switch. If you include the **-o** switch, the command will be executed without asking for user confirmation. Also, see the example in unbind on page 352.

-host *HostName*	Specifies the user-defined hostname.
-gname *StorageGroupName*	*StorageGroupName* specifies the storage group name.
-uid *StorageGroupUID*	*StorageGroupUID* specifies the unique ID.

storagegroup command, -create switch -create -gname *StorageGroupName*

Creates a storage group. You must use the **-gname** switch with **-create**. Also see the example in unbind on page 352.

-gname *StorageGroupName*	*StorageGroupName* specifies a user-defined storage group name.

storagegroup command, -destroy switch -destroy -gname *StorageGroupName* **| -uid** *StorageGroupUID* **[-o]**

Destroys the specified storage group. If you include the **-o** switch, the command will be executed without asking for user confirmation. You must use one of the following switches with **-destroy**:

-gname *StorageGroupName*	*StorageGroupName* specifies a user-defined storage group name.
-uid *StorageGroupUID*	Specifies the storage group UID.

storagegroup command, -disconnecthost switch -disconnecthost -host *HostName* **[-o]**

Disconnects all of the specified host's HBA/SP combinations from the currently connected storage group, and reconnects them to **~management**. You must specify the host using the **-host** switch. If the **-o** switch is present, the command will be executed without asking for user confirmation.

-host *HostName*	*HostName* specifies the user-defined hostname.

storagegroup command, -enable switch [-o]

Enables data access control. Sets the default storage group to **~management**. If the **-o** switch is present, the command will be executed without asking for user confirmation.

storagegroup command, -list switch -list [-gname *StorageGroupName* | **-uid** *StorageGroupUID*] **-host**

Displays information about the specified storage group. When no storage group is specified, **-list** displays information about each user-defined storage group in the system. You can use one of the following optional switches with **-list**.

-gname *StorageGroupName*	*StorageGroupName* specifies a user-defined storage group name.
-host	Displays the hostname of the attached host.
-uid *StorageGroupUID*	Specifies the storage group unique ID.

storagegroup command, -removehlu switch -removehlu -gname *StorageGroupName* | **-uid** *StorageGroupUID* **-hlu** *hlunumber*

Removes the specified host LUN number from the specified storage group. You must use one of the following switches:

-gname *StorageGroupName*	*StorageGroupName* specifies a user-defined storage group name.
-uid *StorageGroupUID*	Specifies the storage group UID.
-hlu *hlunumber*	*hlunumber* specifies the logical unit number, which is the number that the system server will see. This switch is required along with either the **-gname** or **-uid** switch.

storagegroup command, -removesnapshot switch -removesnapshot -gname *StorageGroupName* | **-uid** *StorageGroupUID* **-snapshotname** *snapshotname* | **-snapshotwwn** *snapshotUID*

Removes a snapshot from a storage group. You must use one of the four following switches with **-removesnapshot**:

-gname *StorageGroupName*	*StorageGroupName* specifies the user-defined storage group name.
-uid *StorageGroupUID*	Specifies the storage group unique ID.
-snapshotname *snapshotname* | **-snapshotwwn** *snapshotUID*	Specifies the snapshot name or UID number (World Wide Name, WWN). One of these switches is required.

storagegroup command, -sethost switch -sethost [-host *hostname* **| -ip** *host-ip-address* **[-arraycommpath 0|1] [-failovermode 0|1|2 |3|4] [-type** *initiator-type***] [-unitserialnumber array|lun] [-o]**

Creates or changes certain settings for all initiators (HBAs) in the specified host that are connected to a specific system. You must specify the host (**-host** switch), unless you are issuing the command in the current host. To obtain **-sethost** status, use the **port list** command. The **-sethost** function has subfunction switches as follows.

Note: For AX4-5 series systems, the **storagegroup** command with the **-sethost** switch will accept nondefault values for the following switches: **-failovermode**, **-arraycommpath**, **-type**, and **-unitserialnumber**.

-arraycommpath 0 | 1

storagegroup **-sethost** with **-arraycommpath** modifies one or more communication paths between the server and system. A communication path is a logical path between the host and the system. It may be needed when there is no LUN owned by an SP through which the host recognizes the system and in the storage group through which the host recognizes the system.

Note: AX series systems support only **arraycommpath** setting 1.

Changing the **arraycommpath** setting may force the system to reboot. The CLI will issue a confirmation request that indicates whether a system reboot is required. However, the CLI will not issue a confirmation request if you include the **-o** switch.

CAUTION Do not issue this command option unless you know the appropriate value for the type of failover software running on the servers connected to the specified storage group. The command is designed for transition from one type of failover software to another. Changing the arraycommpath to the wrong value will make the storage group inaccessible to any connected servers.

This form of **-arraycommpath** works for a host. For an entire system, or unshared storage, use the command **arraycommpath**.

To discover the current setting of **arraycommpath**, use the **port -list -all** or **port -list -arraycommpath** command.

0	Disables the communication path previously enabled.
1	Enables a communication path.

Example with arraycommpath:

```
naviseccli -h ss1_spa storagegroup -sethost -hostname
 server101 -arraycommpath 1
```

storagegroup -sethost with **-failovermode** sets the type of trespass needed for failover software. Use this command with certain types of failover software as suggested in the failover software release notice or manual.

Changing the **failovermode** setting may force the system to reboot. The CLI will issue a confirmation request that indicates whether a system reboot is required. However, the CLI will not issue a confirmation request if you include the **-o** switch.

CAUTION Do not issue the **failovermode** command option unless you know the appropriate value for the type of failover software running on the servers connected to the specified storage group. The command is designed for transition from one type of failover software to another. Changing the failovermode to the wrong value will make the storage group inaccessible to any connected servers.

This method of setting **-failovermode** works for systems with storage group only. For systems without storage group, use the command **failovermode** (see failovermode on page 123).

To discover the current setting of **failovermode**, use the **port -list -failovermode** or **port -list -all command**.

Note: For information about when to use these failover modes, refer to the *Installation Roadmap for CLARiiON Storage Systems*, which is on the EMC Powerlink website.

0	Failover mode 0.
1	Failover mode 1.

Note: AX series systems support only failover mode setting 1.

2	Failover mode 2.
3	Failover mode 3.
4	Failover mode 4.

Example with failovermode:

```
naviseccli -h ss1_spa storagegroup -sethost
-failovermode 1 -hostname server102
```

-hostname [*host*] Specifies the HBA owner's hostname. You must specify the host's hostname or its IP address (**-ip** *host-ip-address* switch).

-ip *host-ip-address* Specifies the IP address of the host, in the form xx.xx.xx.xx. You must specify either the IP address or the hostname. The IP address can be specified as an IPv4 or IPv6 address. If an incorrect IP address is specified, the error message is displayed as follows:

```
The IP address must be specified as an IPv4 address
in dotted-decimal format or as an IPv6 address in
colon-hexadecimal notation.
```

-type *initiatortype* Specifies an initiator type to override the system default. The CLI uses the default, 3, for the target if omitted. Type values (specify 0x to indicate hex) are as follows:

0x2	HP (auto trespass)
0x3	Open (default).
0x9	SGI
0xa	HP (no auto trespass)
0x13	Dell
0x16	Fujitsu
0x1c	Compaq Tru64

Note: AX series systems support only type 0x3.

-unitserialnumber [**array**|**lun**] The **unitserialnumber** command displays or sets the VDPP80 behavior mode, which defines how subsequent VPDP80 requests will be populated with the system serial number. You might need to do this for software such as SunCluster 3. You can discover the mode with the **port -list -unitserialnumber** or **port -list -all** command. To set this mode for a host, see **storagegroup -sethost** above.

array Sets the behavior mode to system.

lun Sets the behavior mode to LUN.

Note: Not supported on AX series systems.

Example with unitserialnumber:

```
naviseccli -h ss1_spa storagegroup -sethost
-unitserialnumber lun
```

storagegroup command, -setpath switch -setpath [-gname *StorageGroupName*| **-uid** *StorageGroupUID*] **[-arraycommpath 0|1] [-failovermode 0|1|2 |3|4] [-hbauid** *hbauid*] **[-host** *hostname*] **[-ip** *ip-address*] **[-sp a|b] [-spport 0|1] [-unitserialnumber** *array*|*lun*] **[-o]**

Creates or changes settings for a specific initiator (HBA). You must specify the HBA (**-hba** switch), SP (**-sp**), and SP port (**-spport**). You can identify the storage group by name (**-gname** switch) or unique ID (**-uid** switch). If you omit both switches, the CLI uses the default path. To obtain **-setpath** status, use the **port list** command. The **-setpath** function has many function switches as follows.

Note: The **storagegroup** command with the **-setpath** switch is supported on AX4-5 series systems, but is not supported on other AX series systems.

-arraycommpath 0|1

storagegroup -setpath with **-arraycommpath** modifies one or more communication paths between the server and system. It may be needed when there is no LUN owned by an SP through which the host recognizes the system and in the storage group through which the host recognizes the system.

Changing the **arraypath** setting forces the system to reboot.

This form of **-arraycommpath** works for systems with storage group only. For systems without storage group, use the command **arraycommpath** (see arraycommpath on page 63).

To discover the current setting of **arraycommpath**, use the **port -list -arraycommpath** or **port -list -all** command.

0	Disables the communication path previously enabled.
1	Enables a communication path.

Example with arraycommpath:

```
naviseccli -h ss1_spa storagegroup -setpath -gname
Group1
-hbauid
10:00:00:00:C9:20:DE:0C:10:00:00:00:C9:20:DE:0C
-sp a -spport 0 -arraycommpath 1
```

-failovermode 0|1|2 |3|4

storagegroup -setpath with **-failovermode** sets the type of trespass needed for failover software. Use this command with certain types of failover software as suggested in the *Installation Roadmap for CLARiiON Storage Systems*, which is on the EMC Powerlink website.

Changing the **failovermode** setting may force the system to reboot. The CLI will issue a confirmation request that indicates whether a system reboot is required. However, the CLI will not issue a confirmation request if you specified the **-o** switch.

This form of **-failovermode** works for one storage group. To set the entire system mode, use the command **failovermode**.

To discover the current setting of **failovermode**, use the **port -list -failovermode** or **port -list -all** command.

0	Failover mode 0.
1	Failover mode 1.
2	Failover mode 2.
3	Failover mode 3.
4	Failover mode 4.
-o	Executes the command without prompting for confirmation.

Example with failovermode:

```
naviseccli -h ss1_spa storagegroup -setpath -gname
Group1 -hbauid
10:00:00:00:C9:20:DE:0C:10:00:00:00:C9:20:DE:0C
-sp a -spport 0 -failovermode 1
```

-gname *StorageGroupName* — *StorageGroupName* specifies a user-defined storage group name. Use this or the storage group unique ID (below).

-hbauid *hbauid* — Specifies the HBA unique ID (WWN). Required.

-host [*hostname*] — Specifies the HBA owner's hostname. The system uses the hostname (or **-ip** *address* switch) for any subsequent **storagegroup -connecthost** and **-disconnecthost** commands you issue. If you omit this, the system uses the HBA UID. Not required.

-ip *address* — Specifies the HBA owner's IP address (server's IP address). You can specify the IP address as the IPv4 or IPv6 address. Not required. See **-hostname** switch.

-sp a|b — Specifies the SP that owns the storage group. Required.

-spport 0|1 — Specifies the SP port. Required.

-uid *StorageGroupUID* — Specifies the storage group unique ID.

-unitserialnumber *array*|*lun*	Sets the unit serial number operation mode. Use this switch if the software instructs you to.
-o	Executes the command without prompting for confirmation.

storagegroup command, -shareable switch -shareable [-gname *StorageGroupName* **[yes|no] | -uid** *StorageGroupUID* **[yes|no]]**

Specifies whether more than one host can share the storage group. You must use one of the following switches with **-shareable**, followed by a **yes** or a **no**. A **yes** or **no** indicates whether the storage group can be shared. Only Unisphere can enforce sharing.

-gname *StorageGroupName* **yes|no**	Sets the storage group named *StorageGroupName* to be shareable (**yes**) or not shareable (**no**).
-uid *StorageGroupUID* **yes|no**	Sets the storage group with unique ID *StorageGroupUID* to be shareable (**yes**) or not shareable (**no**).

EXAMPLE # 1

In the following example, Unisphere connects all of `ss1_spa's` HBA-SP combinations to the storage group mail.

```
naviseccli -h ss1_spa storagegroup -gname mail -connecthost -o
```

EXAMPLE # 2

In the following example, the **-list** command displays storage group information.

```
naviseccli -h ss1_spa storagegroup -list
```

```
Storage Group Name: Blade 150
Storage Group UID:
34:C7:72:A9:2D:DB:D8:11:AF:5E:08:00:1B:43:73:EE
HBA/SP Pairs:

HBA UID                                          SP Name
SPPort
-------                                          -------
------
20:00:00:00:C9:39:40:C7:10:00:00:00:C9:39:40:C7 SP B
0
20:00:00:00:C9:39:40:C8:10:00:00:00:C9:39:40:C8 SP A
0

HLU/ALU Pairs:

HLU Number ALU Number
---------- ----------
0           15
1           14
2           13
3           11
4           10
5           9
6           7
7           6
8           5
9           3
10          2
11          1
Shareable: YES
```

EXAMPLE # 3

The following examples creates two storage groups, connects them to separate hosts, and adds a LUN to each one.

```
naviseccli -h ss_spa storagegroup -create -gname Production

naviseccli -h ss_spa storagegroup -create -gname Backup

naviseccli -h ss_spa storagegroup -connecthost -o -host ServerABC
-gname Production

naviseccli -h ss_spa storagegroup -connecthost -o -host ServerXYZ
-gname Backup

naviseccli -h ss_spa storagegroup -addhlu -gname Production -hlu
20 -alu 20

naviseccli -h ss_spa storagegroup -addhlu -gname Backup -hlu 21
-alu 21
```

EXAMPLE # 4

The following example of **storagegroup setpath** and **storagegroup sethost** with **failovermode** sets the type of trespass needed for failover software. Also, the failover mode option is set to 4 in **sethost** and **setpath** switches.

```
naviseccli -h 10. 4. 78. 184 -user a -password a -scope 0 storagegroup
-sethost -ip 10.4.78.184 -failovermode 4

naviseccli -h 10. 4. 78. 184 -user a -password a -scope 0 storagegroup
-setpath -hbauid xxxxx-sp a -spport xxxxx -failovermode 4
```

EXAMPLE # 5

The following example specifies the form of failovermode for one storage group. For the options **-failovermode** and **-all**, the command displays the new failover mode as 4 under the HBA information section when the failover mode is active/active.

```
naviseccli -h 10. 4. 78. 184 -user a -password a -scope 0 port -list
-failovermode

Information about each port of this HBA
SP Name : SP A
SP Port ID : 0
Failover Mode : 4


naviseccli -h 10. 4. 78. 186 -user a -password a -scope 0 port -list -all

HBA UID: 20 : 20 : 20 : 20 : 20 : 20 : 20 : 20 : 20
: 20 : 20 : 20 : 20 : 20 : 20
Server Name : TCS_Dell
Server IP Address : 10 . 4 . 78 . 159
HBA Model Description: 2
HBA Vendor Description : DELL
HBA Device Driver Name : N/A
Information about each port of this HBA :
SP Name : SP A
SP Port ID : 0
HBA Devicename : N/A
Trusted : NO
Logged In : NO
Defined : YES
Initiator Type : 3
StorageGroup Name : None
Array Commpath : 1
Failover mode : 4
Unit serial number : Array
```

systemtype

Sets the system type

PREREQUISITES

For **naviseccli**, you must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **naviseccli systemtype** command changes the configured system type. Write caching must be disabled for this command to work. Changing the system type causes an SP to restart.

If you issue the command without arguments, the CLI will display both the current and configured system types.

Note: Do not change the system type of any system running storage group. Do not change the system type of a system unless it has been quiesced. The agent must be running and managing the system.

Depending on the type of HP-UX operating system, you may want auto-trespass to be on or off.

SYNTAX

systemtype -config [*type*] [**-o**]

OPTIONS

-config [*type*]

Sets the system type to one of the following:

A	HP-UX type with auto-trespass off; use this if your HP-UX system does not have the PVLINKS feature.
2	HP-UX type with auto-trespass on; use this if your HP-UX system has the PVLINKS feature.
3	Open system (default)
9	SGI (CX600)
13	Dell
16	Fujitsu
1C	HP type

-o

Executes the command without prompting for confirmation.

EXAMPLE # 1

```
naviseccli -h ss1_spa systemtype

The configured system type is: 0x3
The current system type is: 0x3
```

EXAMPLE # 2

```
naviseccli -h ss1_spa systemtype -config 2

In order for this command to execute, write cache
must be disabled and memory size set to zero:
```

EXAMPLE # 3

This example sets the system type to an HP-UX system type with auto-trespass on. The newly configured system type will become the current system type after the SP restarts.

```
naviseccli -h ss1_spa setcache -wc 0.

This operation will cause a system reboot!
DO YOU WISH TO CONTINUE? (y/n) y
```

trespass

Trespasses one or more LUNs to the control of an SP

PREREQUISITES

For **naviseccli**, you must have a user account on the system on which you want to execute the command.

DESCRIPTION

This command trespasses one or more LUNs to the control of an SP.

Note: Not applicable to single-SP systems.

The command attempts to trespass all specified LUNs to the SP you specify with the **-h** switch.

Note: If trespass is executed while I/O processes are active, I/O errors may occur.

SYNTAX

trespass [**all** | **lun** *lun-number* | **mine**]

OPTIONS

all

Trespasses all LUNs in the system.

lun *lun-number*

Trespasses one LUN (specified by *lun-number*).

mine

Performs whatever trespassing is necessary to take all of the LUNs that have this SP as a default owner.

EXAMPLE

```
naviseccli -h ss1_spa trespass all
```

OUTPUT

There is no output. Errors are printed to stderr.

unbind

Deconfigures a LUN

PREREQUISITES

For **naviseccli**, you must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **naviseccli unbind** command deconfigures LUNs from their current logical configuration. The unbind command destroys all data on the LUN; therefore, when you execute an unbind command, you are prompted to verify that you really want to unbind the LUN(s). If you do not want the prompt to appear, you can override prompting using the **-o** switch.

The command can unbind only LUNs owned by the SP you specify with **-h**.

You can unbind multiple LUNs at the same time.

Note: You cannot use this command to unbind thin LUNs.

SYNTAX

unbind *lun* [**-o**]

OPTIONS

lun

Specifies the LUN to be deconfigured.

-o

Executes the command without prompting for confirmation.

EXAMPLE # 1

This command destroys (deconfigures) LUN 3 without prompting you for permission, and frees its disks to be reconfigured.

```
naviseccli -h ss1_spa unbind 3 -o
```

EXAMPLE # 2

This command destroys (deconfigures) LUNs 0, 1, 2, 3, and 4 without prompting you for permission, and frees its disks to be reconfigured.

```
naviseccli -h ss1_spa unbind 0 1 2 3 4 -o
```

unitserialnumber

Displays or changes the VDPP80 (port 80) behavior mode

PREREQUISITES

For **naviseccli**, you must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **naviseccli unitserialnumber** command displays or sets the VDPP80 behavior mode, which defines how subsequent VPDP80 requests will be populated with the system serial number. You might need to do this for software such as SunCluster 3.

To set this mode for a specific storage group, see the **storagegroup** command in storagegroup.

SYNTAX

```
unitserialnumber [array|lun] [-o]
```

OPTIONS

array

Sets the behavior mode to system.

lun

Sets the behavior mode to LUN.

-o

Executes the command without prompting for confirmation.

EXAMPLE

These two commands display the current behavior mode and then set the mode to system mode.

```
naviseccli -h ss1_spa unitserialnumber

Current unit serial number mode is: LUN

naviseccli -h ss1_spa unitserialnumber array
```

LUN Expansion (metaLUN) commands

This section explains the Navisphere CLI commands that manage Unisphere metaLUNs.

MetaLUNs overview

A metaLUN is a type of LUN whose maximum capacity is the combined capacities of all the LUNs that compose it. The metaLUN feature lets you dynamically expand the capacity of a single LUN (base LUN) into a larger unit called a metaLUN. You do this by adding LUNs to the base LUN. You can also add LUNs to a metaLUN to further increase its capacity. Like a LUN, a metaLUN can belong to a storage group, and can participate in SnapView, MirrorView and SAN Copy sessions.

During the expansion process, the host has access to any existing data on the LUN or metaLUN, but it does not have access to any added capacity until the expansion is complete. Whether you can actually use the increased user capacity of the metaLUN depends on the operating system running on the servers connected to the system.

A metaLUN can include multiple sets of LUNs that are striped together and are independent of other LUNs in the metaLUN. Each set of striped LUNs is called a component. All metaLUNs contain at least one component that includes the base LUN and one or more LUNs. Any data that gets written to a metaLUN component is striped across all the LUNs in the component.

You can expand a LUN or metaLUN in two ways — stripe expansion or concatenate expansion. A stripe expansion takes the existing data on the LUN or metaLUN, and restripes (redistributes) it across the existing LUNs and the new LUNs you are adding. The stripe expansion may take a long time to complete. A concatenate expansion creates a new metaLUN component that includes the new LUNs and appends this component to the end of the existing LUN or metaLUN. There is no restriping of data between the original storage and the new LUNs. The concatenate operation completes immediately.

Figure 3 on page 355 depicts a LUN using stripe expansion to add two LUNs. The result is a metaLUN with a single component consisting of all three LUNs with the data on the base LUN re-striped across all three LUNs.

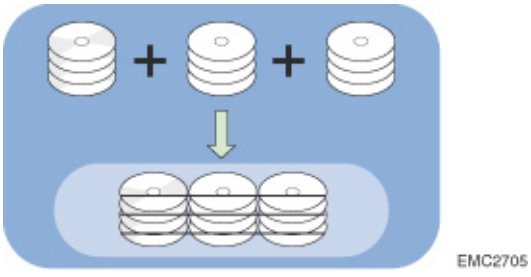


Figure 3. Sample stripe expansion

Figure 4 on page 356 depicts a LUN using concatenate expansion to add two LUNs. The result is a metaLUN with two components. The first component is the base LUN. The second component consists of two new LUNs striped together, but not striped to the first component.

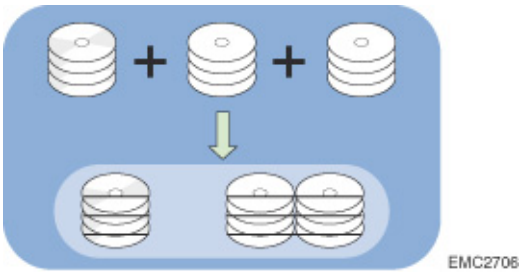


Figure 4. Sample concatenate expansion

Note: EMC does not recommend that you expand LUN capacity by concatenating LUNs of different RAID types. Do this only in an emergency situation when you need to add capacity to a LUN and you do not have LUNs of the same RAID type or the disk capacity to bind new ones. Concatenating metaLUN components with a variety of RAID types could impact the performance of the resulting metaLUN. Once you expand a LUN, you cannot change the RAID type of any of its components without destroying the metaLUN. Destroying a metaLUN unbinds all LUNs in the metaLUN, and therefore causes data to be lost.

CLI metaLUN command functions

The **naviseccli** metaLUN command functions, listed alphabetically, are

- **metalun -destroy**
- **metalun -expand**
- **metalun -info**
- **metalun -list**
- **metalun -modify**

The CLI metaLUN functions are listed functionally, in the order you would perform them, in Table 5 on page 357.

Table 5. naviseccli metaLUN command functions, listed in order of use

Essential functions (in order performed)	
metalun -expand	Creates a metaLUN or expands one
metalun -destroy	Destroys a metaLUN and then unbinds all LUNs that were part of the metaLUN
Optional and status functions (alphabetically)	
metalun -info	Provides metaLUN information with respect to a specific system
metalun -list	Lists the properties of existing metaLUNs
Optional reconfiguration functions (alphabetically)	
metalun -modify	Modifies certain metaLUN properties

metalun -destroy

Destroys a metaLUN and unbinds all LUNs that were part of the metaLUN.

PREREQUISITES

You must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **naviseccli metalun** command with the **-destroy** switch destroys an existing metaLUN and then unbinds all LUNs that were part of the metaLUN. You will lose all data on the LUNs.

Note: You cannot destroy a metaLUN that belongs to a storage group. You must remove the metaLUN from the storage group in order to destroy it. You cannot destroy any metaLUNs that are currently participating in a snapshot, clone, mirror or SAN Copy session.

SYNTAX

metalun -destroy -metalun *number|WWN|* **[-o]**

OPTIONS

-metalun *number|WWN*

Specifies the unique number or World Wide Name of the metaLUN you want to destroy. Use only one of the identifiers with the **-metalun** command. Use the **metalun -list** command to determine the number or WWN of the metaLUN (see metalun -list on page 368).

-o

Executes the command without prompting for confirmation.

EXAMPLE

This command destroys the metaLUN with the number 20.

```
naviseccli metalun -destroy 20
```

metalun -expand

Creates a new metaLUN or expands the capacity of an existing one

PREREQUISITES

This section describes the general requirements and recommendations for both a stripe and concatenate expansion, as well as those specific to one or the other.

General expansion requirements and recommendations

- Each LUN within a metaLUN must be either a redundant (RAID 6, RAID 5, RAID 3, RAID 1, RAID 1/0) or non-redundant (RAID 0, disk) RAID type.
- All disks within a metaLUN must be the same type.
- You can expand only the last component of a metaLUN.
- Expansion LUNs cannot be participating in a SnapView, MirrorView or SAN Copy session.

Stripe expansion requirements and recommendations

All LUNs within a striped metaLUN or metaLUN component must be the same size and RAID type, and we recommend that each LUN:

- be from a different RAID group.
- includes the same number of disks.
- has the same stripe element size.

Concatenate expansion requirements and recommendations

All LUNs within a concatenated metaLUN component must be the same size and RAID type, but can differ from the size and RAID type of LUNs within other components.

Note: EMC does not recommend that you expand LUN capacity by concatenating LUNs of different RAID types. Do this only in an emergency situation when you need to add capacity to a LUN and you do not have LUNs of the same RAID type or the disk capacity to bind new ones. Concatenating metaLUN components with a variety of RAID types could impact the performance of the resulting metaLUN. Once you expand a LUN, you cannot change the RAID type of any of its components without destroying the metaLUN. Destroying a metaLUN unbinds all LUNs in the metaLUN, and therefore causes data to be lost.

DESCRIPTION

The **metalun -expand** command is used with **naviseccli** (described on page41). The **naviseccli metalun** command with the **-expand** function creates a new metaLUN or expands the capacity of an existing one. There are two distinct versions of this command, one for Unisphere and one for Navisphere Express. When using this command with Navisphere Express, the syntax is simpler and does not require binding the destination LUN first. The process is different with Unisphere and requires you to bind the destination LUN before running the command. See the Prerequisite section above for requirements and recommendations.

Note: Thin LUNs do not support metaLUNs, so you cannot create metaLUNs using thin LUNs.

For raw device mapping volumes (RDMs), if you are running VMware ESX Server, after you create or expand the metaLUN, you must rescan the bus at the ESX Server level. You can also rescan at the virtual machine level (optional). You then must expand the file system at the virtual machine level. ESX Server and the virtual machine will now recognize the new or expanded metaLUN.

For configuration specifications, go to the E-Lab™ Interoperability Navigator on EMC Powerlink.

SYNTAX

metalun -expand -base *number*|*WWN* **-lus** *number*|*WWN* [**-autoassign 0**|**1**] [**-bind offset** *sector-number*] [**-cap** capacity]
[**-defaultowner A**|**B**] [**-elszm** *elementSizeMultiplier*]
[**-expansionrate low**|**medium**|**high**|**ASAP**|*value*]
[-name *metaLUNname*] [**-preservedata 1**|**0**] [**-nogrow**] [**-o**]
[**-sq tb**|**gb**|**mb**|**bc**] [**-type C**|**S**]

metalun -expand -base *number*|*WWN* **-lus** *number*|*WWN* [**-type C**|**S**] [**-sq tb**|**gb**|**mb**|**bc**] [**-cap** *number*] [**-nogrow**] [**-o**]

metalun -expand -base *number*| *WWN* [**-sq tb**|**gb**|**mb -cap** *number*] [**-percent** *number*] [**-o**]

OPTIONS

-base *number*|*WWN*

Specifies the unique number or World Wide Name of the LUN or metaLUN you want to expand. Use only one of the identifiers with the **-base** switch. Use the **metalun -list** command to determine the number or WWN of the LUN or metaLUN (see metalun -list on page 368).

When you specify a LUN with the **-base** command, the CLI creates a new metaLUN with the number and WWN of the base LUN. Once the CLI creates the new metaLUN, it assigns a new WWN to the original base LUN and makes it a private LUN. When expanding a single LUN, you can use any or all of the **-expand** switches.

Note: The base LUN can belong to a storage group. Expansion LUNs cannot belong to a storage group.

When you specify an existing metaLUN with the **-base** command, the CLI expands the capacity of the existing metaLUN. The following switches are not valid during the expansion of an existing metaLUN: -**name**, -**preservedata**, **-expansionrate**, **-defaultowner**, **-autoassign**, -**elsz**, and **-bindoffset**. The expanded metaLUN retains the values of the original metaLUN. After the metaLUN is expanded, use the **metalun -modify** command to change the metaLUN using **-name**, **-expansionrate**, **-defaultowner**, or -**autoassign**. The **-preservedata**, **-elsz** and **-bindoffset** values cannot be changed.

-lus *lunnumber*|*WWN*

Specifies the LUN number or World Wide Name of the LUNs you want to add to the LUN or metaLUN (expansion LUNs). Use only one of the identifiers per LUN with the **-lus** command. Use the metalun **-list** command to determine the number or WWN of the LUNs (see metalun -list on page 368).

Note: Expansion LUNs cannot be participating in a SnapView (snapshot or clones), MirrorView, or SAN Copy session.

-autoassign 0|1)

Important: This switch is not supported on AX4-5 series systems running Unisphere.

Enables or disables autoassign for a metaLUN. Specify 1 to enable autoassign and 0 to disable it. If you do not specify an autoassign value, it defaults to the value of the base LUN.

Autoassign controls the ownership of the LUN when an SP fails in a system with two SPs. With autoassign enabled, if the SP that owns the LUN fails and the server tries to access that LUN through the second SP, the second SP assumes ownership of the LUN to enable access. The second SP continues to own the LUN until the failed SP is replaced and the system is powered up. Then, ownership of the LUN returns to its default owner. If autoassign is disabled in the previous situation, the second SP does not assume ownership of the LUN, and access to the LUN does not occur.

If you are running failover software on a Windows or UNIX server connected to the system, you must disable autoassign for all LUNs that you want to fail over to the working SP when an SP fails.

-bindoffset *sector-number*

Important: This switch is not supported on AX4-5 series systems running Unisphere.

Note: Available only if the **preservedata** switch is set to 0.

EMC does not recommend using a metaLUN bindoffset value if the base LUN already has one.

Automatically aligns the logical sector number of the metaLUN to a stripe boundary on the base LUN. The value to enter is the number of sectors by which user data is offset due to file system or partition metadata. Correct application of the bind offset should result in improved performance. Use a decimal, not hexadecimal, number for sector-number. If you do not specify a bind offset value, it defaults to 0.

-cap *capacity*

Specifies the capacity of usable space in the metaLUN. The capacity must be smaller than the maximum capacity of the metaLUN components, and greater than or equal to the current capacity (user capacity of the LUN or metaLUN before adding LUNs). The default value is the maximum capacity of the metaLUN (total capacity of the existing LUNs and any new LUNs).

Note: If you want to expand a LUN or metaLUN that is participating in a SnapView (snapshot or clone), MirrorView, or SAN Copy session, you must use the **-nogrow** switch with the **-expand -cap** command. This command expands the capacity of the LUN or metaLUN to the specified value, but keeps the available user capacity of the base (LUN or metaLUN) the same as it was before adding LUNs. In order for the host to have access to the added capacity, you must wait for the session to complete and then follow the instructions in Using the added capacity of an expanded SnapView, MirrorView or SAN Copy LUN on page 377.

-defaultowner A|B

Specifies the SP that will assume ownership of the metaLUN when the system is powered up. If you do not specify a default owner, it defaults to the owner of the base LUN.

-elszm *elementSizeMultiplier* **(Not supported on AX4-5 series systems running Unisphere)**

Sets the stripe element size for a metaLUN component. You determine this by multiplying the stripe size of the first LUN in each component by the element size multiplier. The stripe size of the first LUN = stripe element size of the LUN multiplied by the number of disks in the LUN. Valid multiplier values are 1 through 255. The default element size multiplier is 4. For more information on the metaLUN stripe multiplier, refer to the *EMC CLARiiON Best Practices for Fibre Channel Storage: FLARE Release 26 Firmware Update*, available on the Powerlink website.

-expansionrate low|medium|high|ASAP| *value*

Specifies the relative importance of making additional LUN capacity available to the host. It determines the amount of resources the SP devotes to re-striping the existing data on the original LUNs across the original LUNs and the new LUNs instead of to normal I/O activity. This rate is available only when you first create a metaLUN and is important only for a stripe expansion. Valid rebuild priorities are ASAP (default) or 3, High or 2, Medium or 1, and Low, or 0.

An expansion rate of ASAP or High re-stripes the data across the metaLUN faster than one with Medium or Low priority, but may degrade system performance.

-name *metaLUN-name*

Specifies the name of the metaLUN. If you do not specify a name, it defaults to the name of the base LUN.

-nogrow

Keeps the available user capacity of the metaLUN the same as it was before adding LUNs. You cannot use the added capacity until you change the capacity using the **-modify** switch.

Note: For a stripe expansion, any existing data is restriped across the original storage and any new LUNs, but you cannot access the added capacity at this time.

-o

Executes the command without prompting for confirmation.

-preservedata 1|0

Use with the **-type S** command (see below). Allows you to preserve or overwrite any existing data on the base LUN, only if the base LUN is outside a storage group.

Note: You cannot use this command with the **-type C** switch.

If the base LUN is outside of a storage group, do one of the following:

- Specify 1 to enable stripe expansion and preserve the data on the base LUN. Note that this operation could take a while. The default value is 1.

  Note: You must always specify 1 when the base LUN is in a storage group. The CLI returns an error message if you specify 0 in this case.

- Specify 0 to enable stripe expansion and overwrite the existing data on the base LUN. Note that you will lose the original data on the LUN.

-sq tb|gb|mb|bc

Specifies the size qualifier for the capacity of the metaLUN component.

where:

tb equals terabytes, gb equals gigabytes, mb equals megabytes and bc equals block count.

Note: The default qualifier is block count. AX4-5 series systems running Unisphere support only terabytes (TB), gigabyte (GB), and megabyte (MB) size qualifiers.

AX series systems support only megabyte (MB) and gigabyte (GB) size qualifiers.

-type **c|s**

Sets the expansion type for the metaLUN to concatenate or stripe. The default expansion type is stripe.

c sets the expansion type to concatenate. A concatenate expansion appends the new LUNs to the end of the base LUN component or metaLUN as a single, separate striped component. There is no striping between the original storage and the new LUNs.

s sets the expansion type to stripe. For a list of requirements for stripe expansion, see the Prerequisite section above.

If you are expanding a LUN (the base LUN), the **-type s** switch creates a metaLUN with one component that includes the base LUN and any LUNs that you add. Any data on the base LUN is re-striped across the base LUN and the new LUNs.

Note: If the base LUN has existing data, and it is outside of a storage group, refer to the **-preservedata** switch (see above) for additional options.

You can expand only the last component of an existing metaLUN. In this case, the **-type s** switch re-stripes any existing data across the original LUNs in the component and any new LUNs that you add. The new LUNs become part of that metaLUN component.

-base *number|WWN*

Mandatory switch, supported with Navisphere Express, that specifies the source LUN or metaLUN you want to expand. You can specify the base number or World Wide Name of the LUN.

-cap *number*

Mandatory switch, supported with Navisphere Express, that specifies the additional storage capacity you can add to the LUN or metaLUN. The size qualifier for the **-cap** *number* is the **-sq** switch.

-sq **tb|gb|mb**

Mandatory switch, supported with Navisphere Express, that specifies the size qualifier for the capacity of the metaLUN component.

where:

tb equals terabytes, **gb** equals gigabytes, and **mb** equals megabytes.

For example, if you are expanding a 20 GB LUN, and specify `-sq gb -cap 20` in the command, the resulting metaLUN is 40 GB.

-percent *number*

Optional switch for Navisphere Express that specifies the amount of additional storage you want to expand by, as a percentage of the current size of the LUN. The *number* should always be greater than 0. This switch can be used instead of **-sq** and **-cap** *number* switches.

For example, if you are expanding a 20 GB LUN, and specify **-percent** `50` in the command, the resulting metaLUN is 30 GB.

Note: For AX4-5 series systems running Navisphere Express, the default expansion type is concatenate. The stripe expansion type is not supported on AX4-5 series systems.

The AX4-5 series systems support only an expansion rate of high.

EXAMPLE # 1

For Navisphere Manager, this command creates a metaLUN with the name newMetaLUN, which includes base LUN 20 and LUN 42. Since the default expansion type is stripe, this metaLUN is striped.

```
naviseccli metalun -expand -base 20 -lus 42 -name newMetaLUN
```

EXAMPLE # 2

For Navisphere Express, this command expands a metaLUN by 1 GB.

```
naviseccli metalun -expand -base 1 -sq gb -cap 1
```

metalun -info

Provides general information about a system's metaLUN environment.

PREREQUISITES

You must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **naviseccli metalun** command with the **-info** function and no other options displays all general information about the metaLUN environment for a system. Issuing this command with one or more options displays the information based on the options issued.

SYNTAX

```
metalun -info [-canexpand] [-nummetaluns] [-maxmetaluns] [-maxcomponents]
[-maxluns] [-availableluns] [-lunsinmeta]
```

OPTIONS

-canexpand

Specifies whether you can or cannot expand any LUNs or metaLUNs on the system. Valid values are Yes or No.

-nummetaluns

Displays the number of metaLUNs in the system.

-maxmetaluns

Displays the maximum number of metaLUNs that the system will support (based on system type). See the Host Agent/CLI release notes for currently supported values.

-maxcomponents

Displays the maximum number of components allowed per metaLUN for this system (based on system type). See the Host Agent/CLI release notes for currently supported values.

-maxluns

Displays the maximum number of LUNs per component that this system supports (based on system type). See the CLI release notes for currently supported values.

-availableluns

Lists all LUNs (by LUN number) in the system that are available for expansion.

-lunsinmeta

Lists any LUNs (by LUN number) in the system that are part of a metaLUN.

EXAMPLE

This command requests information about the metaLUN environment for the system with SP 10.14.20.57.

```
naviseccli -address 10.14.20.57 metalun -info
```

OUTPUT

```
Can a LUN or a Meta-LUN be expanded on this system: Yes
Number of Meta-LUNs in the system: 7
Maximum Number of Meta-LUNs per system:  1024
Luns that are participating in Meta-LUNs:  513 512 515 514 517 516 519 518
 521 52
0 523 522 525 524
Luns that are available for expansion:  32 43 44 47 48 49 50 51 52 53 54
55 56 5
7 58 59 0
Maximum Number of Components per Meta-LUN:  16
Maximum Number of LUNs per Component:  32
```

The CLI returns status or error information if the command fails.

metalun -list

Lists the properties of existing metaLUNs

PREREQUISITES

You must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **naviseccli metalun** command with the **-list** function and no other options lists all property information for all metaLUNs on a system. Issuing this command with one or more options displays the information based on the options issued.

Note: In order to return values for performance data, you must enable statistics logging for each SP in the system. Use Navisphere CLI or Unisphere. Performance data switches are marked with an asterisk (*).

If you request performance data for a specific metaLUN, make sure that you enter the IP address for the SP that is the current owner of the metaLUN.

SYNTAX

```
metalun -list [-name [metaLUN-name]] [-metalunwwn metaLUN-WWN]
[-metalunnumber metaLUN-number]
[-all] [-aac*] [-actualusercap] [-autoassign] [-bindoffset] [-brw*]
[-components*] [-currentowner] [-canexpand] [-defaultowner]
[-drivetype] [-expansionrate] [-elszm] [-isredundant] [-nzrca]
[-percentexp] [-rhist*] [-rwr*] [-sor] [-state] [-totalusercap] [-whist*]
```

OPTIONS

-name [*metaLUN-name*]

Lists all information for that specific metaLUN.

Issuing the **-name** command without a metaLUN-name displays the names of all metaLUNs on the system.

-metalunwwn *metaLUN-WWN*

Lists all information for that specific metaLUN.

Issuing the **-metalunwwn** command without a metaLUN-WWN displays the WWNs for all metaLUNs on the system.

-metalunnumber *metaLUN-number*

Lists all information for that specific metaLUN.

Issuing the **-metalunnumber** command without a metaLUN-number displays the numbers for all metaLUNs on the system.

-aac*

Displays the active/active counters associated with the metaLUN.

-actualusercap

Displays the current user capacity of all metaLUNs on the system.

Issuing the **-actualusercap** command with a metaLUN name, number or WWN displays the user capacity for that specific metaLUN.

-autoassign

Displays the current state of the autoassign feature for all metaLUNs on the system (Yes or No).

Issuing the **-autoassign** command with a metaLUN name, number or WWN displays the current state of the autoassign feature for that specific metaLUN.

-all

Displays all information for the **metalun -list** command.

-bindoffset

Aligns the logical sector number of all metaLUNs on the system to a stripe boundary on the base LUN.

Issuing the **-bindoffset** command with a metaLUN name, number or WWN returns the value of the bindoffset used for that metaLUN.

-brw*

Displays the number of host block read and write requests to all metaLUNs on the system.

Issuing the **-brw** command with a metaLUN name, number or WWN displays the number of host block read and write requests to that specific metaLUN.

-components*

Displays the contents of all components in all metaLUN on the system.

Issuing the **-components** command with a metaLUN name, number or WWN displays the contents of all components for that specific metaLUN.

-currentowner

Lists the current SP owner of all metaLUNs in the system. If neither SP owns the metaLUN a value of Unknown is returned.

Issuing the **-components** command with a metaLUN name, number or WWN lists the current SP owner of the specified metaLUN.

-canexpand Yes | No

Yes	The specified metaLUN can be expanded.
No	The specified metaLUN cannot be expanded.

-defaultowner

Lists the default SP owner of all metaLUNs on the system.

Issuing the **-defaultowner** command with a metaLUN name, number or WWN lists the default SP owner of the specified metaLUN.

-drivetype

Displays the drive type for all metaLUNs on the system.

Issuing the **-drivetype** command with a metaLUN name, number or WWN displays the drive type for the specified metaLUN.

-expansionrate

Displays the expansion rate for all metaLUNs on the system (see the **-expansionrate low|medium|high|ASAP|** *value* option in metalun -expand on page 359). Valid values are 0 (Low), 1 (Medium), 2 (High), 3 (ASAP), or N/A if the metaLUN is not currently expanding.

Issuing the **-expansionrate** command with a metaLUN name, number or WWN displays the expansion rate for the specified metaLUN (see the **-expansionrate low|medium|high|ASAP|** *value* option in metalun -expand on page 359).

-elszm

Displays the element size multiplier for all metaLUNs on the system (see **-elszm** *elementSizeMultiplier* in metalun -expand on page 359).

Issuing the **-elszm** command with a metaLUN name, number or WWN displays the element size multiplier for the specified metaLUN (see **-elszm** *elementSizeMultiplier* in metalun -expand on page 359).

-isredundant

Displays the redundancy of all metaLUNs on the system:

Yes	if it is redundant
No	if it is not redundant

Issuing the **-isredundant** command with a metaLUN name, number or WWN displays the redundancy of the specified metaLUN.

-nzrca

Returns the nonzero request count arrivals in SP A and SP B.

-percentexp

Displays the percentage complete of the stripe expansion process of all base LUNs or metaLUNs on the system.

Issuing the **-percentexp** command with a metaLUN name, number or WWN displays the percentage complete of the stripe expansion process of the specified base LUN or metaLUN.

-rhist*

Returns read histogram information for all metaLUNs on the system.

Note: A read histogram is an system of 10 locations that contain the number of reads. Element n of the system contains the number of reads that were larger than or equal to 2^n-1 and less than 2^n blocks in size. For example, the first bucket contains the number of 1 block reads, the second contains the number of 2-3 block reads, the third contains the number of 4-7 block reads, and so on. The **-rhist** switch also displays the number of read histogram overflows, which are the number of reads that were larger than 512 blocks.

Issuing the **-rhist** command with a metaLUN name, number or WWN returns the read histogram for the specified metaLUN.

-rwr*

Displays the number of host read and write requests to all metaLUNs on the system.

Issuing the **-rwr** command with a metaLUN name, number or WWN displays the number of host read and write requests to the specified metaLUN.

-sor

Returns the sum of outstanding requests in SP A and SP B.

-state

Displays the current state of all metaLUNs on the system.

When issuing the **-state** command with a metaLUN name, number or WWN displays the state of the specified metaLUN. The following are valid metaLUN states:

Normal	The metaLUN is operating normally.
Degraded	Some part of the metaLUN is faulted, but the metaLUN is still able to process I/O.
Shut down	The metaLUN is faulted and unusable.
Expanding	The metaLUN is in the process of expanding (re-striping data across all component LUNs).

-totalusercap

Displays the total user capacity of all metaLUNs on the system.

Issuing the **-totalusercap** command with a metaLUN name, number or WWN displays the total user capacity of the specified metaLUN.

-whist*

Returns write histogram information for all metaLUNs on the system.

Note: A write histogram is an system of 10 locations that contain the number of writes. Element n of the system contains the number of writes that were larger than or equal to 2^n-1 and less than 2^n blocks in size. For example, the first bucket contains the number of 1 block writes, the second contains the number of 2-3 block writes, the third contains the number of 4-7 block writes, and so on. The **-whist** switch also displays the number of write histogram overflows, which are the number of writes that were larger than 512 blocks.

Issuing the **-whist** command with a metaLUN name, number or WWN returns the write histogram for the specified metaLUN.

EXAMPLE

This command requests information on all metaLUNs that are currently owned by the SP with IP address 10.14.20.57.

```
naviseccli  -address 10.14.20.57 metalun -list
```

OUTPUT

```
Meta-LUN Name:  LUN30
Meta-LUN WWN:  60:06:01:6D:35:0A:00:00:FC:35:5B:8C:66:60:D7:11
Meta-LUN Number:  30
Default Owner:  SP A
Current Owner:  SP B
Meta-LUN State:  ENABLED
Can MetaLUN Be Expanded:  Yes
Expansion Rate:  MEDIUM
Percent Expanded:  0
Total Capacity (Blocks/Megabytes):  819200/400
Actual User Capacity (Blocks/Megabytes): 819200/400
Autoassign:  No
Is Redundant:  Yes
Drive Type:  Fibre Channel
Element Size Multiplier:  40
Bind Offset:  0
Read Histogram [0] :    22
Read Histogram [1] :    14
Read Histogram [2] :    19
Read Histogram [3] :     37
Read Histogram [4] :     6
Read Histogram [5]:      0
Read Histogram [6]:      0
Read Histogram [7]:      0
Read Histogram [8]:      0
Read Histogram [9]:      0
Read Histogram Overflows:      45
Write Histogram [0] :    22
Write Histogram [1] :    22
Write Histogram [2] :    22
Write Histogram [3] :    22
Write Histogram [4] :    22
Write Histogram [5] :    22
Write Histogram [6] :    22
Write Histogram [7] :    22
Write Histogram [8] :    22
Write Histogram [9] :    22
Write Histogram Overflows:      45
Read Requests:  0
Write Requests:  0
Blocks Read:  0
Blocks Written:  0
Components:
Number of LUNs:  2
LUNs:
LUN Number:  513
LUN Name:  LUN 30
LUN WWN:  60:06:01:72:35:0A:00:00:B0:44:01:4B:61:60:D7:11
RAID Type:  RAID5
LUN Number:  512
LUN Name:  LUN 31
LUN WWN:  60:06:01:72:35:0A:00:00:15:FB:3B:4C:61:60:D7:11
RAID Type:  RAID5
   Number of LUNs:  1 (Lists
LUN information for second component)
```

The CLI returns the status or the error information if the command fails.

This command displays the active/active counters for this metaLUN along with other metaLUN output.

```
naviseccli -h 10.14.85.50 -user a -password a -scope 0 metalun -list -
metalunnumber 4 -aac

Host Blocks Read SPA:  6 (optimal)
Host Blocks Read SPB:  0
Host Blocks Written SPA:  0 (optimal)
Host Blocks Written SPB:  0
Host Read Requests SPA:  6 (optimal)
Host Read Requests SPB:  0
Host Write Requests SPA:  0 (optimal)
Host Write Requests SPB:  0
Busy Ticks SPA:  0 (optimal)
Busy Ticks SPB:  0
Idle Ticks SPA:  33224 (optimal)
Idle Ticks SPB:  0
Explicit Trespasses SPA:  0
Explicit Trespasses SPB:  0
Implicit Trespasses SPA:  0
Implicit Trespasses SPB:  0
```

metalun -modify

Modifies certain properties of an existing metaLUN.

PREREQUISITES

You must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **naviseccli metalun** command with the **-modify** function lets you edit certain properties of a specified metaLUN. You must specify either the number or WWN for the metaLUN, and you must specify at least one other switch.

SYNTAX

metalun -modify -metalun *number*|*WWN* [**-autoassign 0**|**1**] [**-capcapacity**] [**-defaultowner A**|**B**]
[**-expansionrate low**|**medium**|**high**|**ASAP**|*value*]
[**-newname** *newName*] [**-o**] [**-sq tb**|**gb**|**mb**|**bc**] [**-tomaxcap**]

OPTIONS

-metalun *number*|*WWN*

Specifies the number or WWN of the metaLUN whose properties you want to change.

-autoassign 1|**0 (Not supported on AX4-5 series systems)**

Enables or disables auto assign for a metaLUN. Specify 1 to enable auto assign and 0 to disable it. If you do not specify an auto assign value, it defaults to the value of the base LUN. For more information about auto assign, see the **-autoassign 0**|**1** option in metalun -expand on page 359.

-cap *capacity*

Specifies the capacity of usable space in the metaLUN. The capacity must be smaller than the maximum capacity of the metaLUN, and greater than or equal to the current capacity (user capacity of the LUN or metaLUN before adding LUNs).

Note: If you want to modify the user capacity of a LUN or metaLUN that is participating in a SnapView (snapshot or clone), MirrorView or SAN Copy session, see Using the added capacity of an expanded SnapView, MirrorView or SAN Copy LUN on page 377.

-defaultowner A|B

Specifies the new default SP owner for the metaLUN — A or B.

-expansionrate low|medium|high|ASAP|*value*

Specifies the relative importance of making additional LUN capacity available to the host. It determines the amount of resources the SP devotes to re-striping the existing data on the original LUNs across the original LUNs and the new LUNs instead of to normal I/O activity. This rate is available only when you first create a metaLUN and is important only for a stripe expansion. Valid rebuild priorities are ASAP (default) or 3, High or 2, Medium or 1, and Low, or 0.

An expansion rate of ASAP or High re-stripes the data across the metaLUN faster than one with Medium or Low priority, but may degrade storage-system performance.

-newname *newName*

Specifies the new name for the metaLUN. A valid name must not exceed 64 characters and must include at least one non-whitespace character. This name must be unique on the system.

-o

Executes the command without prompting for confirmation.

-sq tb|gb|mb|bc

Specifies the size qualifier for the capacity of the metaLUN component.

where:

tb equals terabytes, gb equals gigabytes, mb equals megabytes and bc equals block count. The default qualifier is block count.

Note: AX4-5 series systems running Unisphere support only terabyte (TB), gigabyte (GB), and megabyte (MB) size qualifiers.

-tomaxcap

Lets you expand the metaLUN to its maximum capacity.

Using the added capacity of an expanded SnapView, MirrorView or SAN Copy LUN

You must perform the operations detailed in the following sections to expand the capacity of a LUN or metaLUN that is currently participating in a SnapView, MirrorView or SAN Copy session (see metalun -destroy on page 358), and to allow the host to access the added capacity.

Note: For a stripe expansion, any existing data is re-striped across the original LUN or metaLUN and the added LUNs during the SnapView, MirrorView or SAN Copy session. This re-striping is invisible to the host.

For LUNs in a SnapView session

To access the added capacity of an expanded snapshot source LUN:

1. Stop all SnapView sessions and destroy all snapshots associated with the expanded source LUN (see the SnapView Command Line Interface (CLI) Reference and the online help).

2. Use the metalun -modify on page 375 command to change the capacity of the expanded LUNs.

3. Make sure the host operating system can utilize the added capacity.

You can now start new sessions and create new snapshots with the expanded LUNs (see the *SnapView Command Line Interface (CLI) Reference* and the online help).

For LUNs in a clone group

Note: You must expand the clone and the clone source LUN to the same size.

To access the added capacity of an expanded clone, or clone source LUN, do the following:

1. For the clone, remove the clone from the clone group; for a clone source LUN, destroy the clone group.
2. Use the metalun -modify on page 375 command to change the capacity of the expanded LUNs.
3. Make sure the host operating system can utilize the added capacity.
4. Reconstruct the clone group with the expanded LUNs and then perform a full synchronization of the LUNs in the clone group.

For LUNs in mirrors

Note: You must expand both the primary and secondary images of a mirror to the same size.

To access the added capacity of an expanded primary and secondary MirrorView LUN, do the following:

1. For the expanded primary image, destroy the mirror; for the expanded secondary image, remove it from the mirror (see the *MirrorView CLI Reference* or the online help).
2. Use the metalun -modify on page 375 command to change the capacity of the expanded LUNs.
3. Make sure the host operating system can utilize the added capacity.
4. Reconstruct the mirror with the expanded LUNs and then perform a full synchronization of the mirror.

For LUNs in SAN Copy sessions

Note: If you expand the SAN Copy source logical unit, make sure that the destination LUNs are of equal or greater capacity.

To access the added capacity of an expanded SAN Copy source LUN or destination LUN, do the following:

1. For any sessions that the expanded LUNs are participating in, wait until the SAN copy sessions complete, or stop the sessions, and then remove these sessions. (See the online help).

2. Use the metalun -modify on page 375 command to change the capacity of the expanded LUNs.

3. Make sure the host operating system can utilize the added capacity.

4. Reconstruct the SAN Copy sessions that you removed and then, when you are ready, start the sessions. (See the online help.)

Reserved LUN Pool commands

This section explains how to configure the reserved LUN pool, which is required for running replication software such as SnapView, incremental SAN Copy, or MirrorView/Asynchronous. It also describes the CLI commands that you can use if SnapView is installed on your system.

Introduction to the reserved LUN pool

The global reserved LUN pool works with replication software, such as SnapView, SAN Copy, and MirrorView/A to store data or information required to complete a replication task. The reserved LUN pool consists of one or more private LUNs. The LUN becomes private when you add it to the reserved LUN pool. Since the LUNs in the reserved LUN pool are private LUNs, they cannot belong to storage groups and a server cannot perform I/O to them.

Before you start a replication task, the reserved LUN pool must contain at least one LUN for each source LUN that will participate in the task. You can add any available LUNs to the reserved LUN pool. Each system manages its own LUN pool space and assigns a separate reserved LUN (or multiple LUNs) to each source LUN.

All replication software that uses the reserved LUN pool shares the resources of the reserved LUN pool. For example, if you are running an incremental SAN Copy session on a LUN and a SnapView session on another LUN, the reserved LUN pool must contain at least two LUNs - one for each source LUN. If both sessions are running on the same source LUN, the sessions will share a reserved LUN.

Allocation of the reserved LUN pool

The software allocates reserved LUNs on a per source LUN basis. Each system manages its own reserved LUN pool space and allocates reserved LUNs on a per-source LUN basis, not a per-session basis. For example, if two replication sessions are running on a source LUN, the system assigns reserved LUNs, as needed, to the source LUN, and both sessions share these LUNs.

The assignment of reserved LUNs is based upon the first available free LUN in the global reserved LUN pool. An adequate number of reserved LUNs is essential because the software will terminate sessions if no free LUNs are available in the global reserved LUN pool. If you are running multiple sessions per source LUN and your reserved LUN fills up (runs out of space) and no free LUNs are available in the global reserved LUN pool, the session that is trying to allocate a reserved LUN from this pool will terminate.

Estimating the reserved LUN pool size

Each reserved LUN can vary in size. However, using the same size for each LUN in the pool is easier to manage because the LUNs are assigned without regard to size; that is, the first

available free LUN in the global reserved LUN pool is assigned. Since you cannot control which reserved LUNs are being used for a particular replication session, we recommend that you use a standard size for all reserved LUNs.

If you want to optimize space utilization, you should create many small reserved LUNs, which allows for sessions requiring minimal reserved LUN space to use one or a few reserved LUNs, and sessions requiring more reserved LUN space to use multiple reserved LUNs. On the other hand, if you want to optimize the total number of source LUNs, you should create many large reserved LUNs, so that even those sessions that require more reserved LUN space consume only a single reserved LUN.

Estimating a suitable reserved LUN pool size

The guidelines should help you estimate a suitable reserved LUN pool size for the system.

- If you wish to optimize space utilization, use the size of the smallest source LUN as the basis of your calculations (see the example for optimizing for capacity below). If you wish to optimize the total number of source LUNs, use the size of the largest source LUN as the basis of your calculations (see the example for optimizing for max source LUNs below).
- If you have a standard online transaction processing configuration (OLTP), use reserved LUNs sized at 10-20 percent. This size can accommodate the copy-on-first-write activity.
- If you plan on creating multiple sessions per source LUN, anticipate a large number of writes to the source LUN, or anticipate a long duration time for the session, you may also need to allocate additional reserved LUNs. With any of these cases, you should increase the calculation accordingly. For instance, if you plan to have 4 concurrent sessions running for a given source LUN, you might want to increase the estimated size by 4 – raising the typical size to 40-80 percent.

Note: To protect your replication sessions from being terminated (if no free reserved LUNs were available in the pool), the number of reserved LUNs in the pool should always be two times the number of source LUNs.

Example for optimizing for capacity

The goal is to create 1 session each on 100 source LUNs, where the largest is 100 GB, and the smallest is 50 GB:

- Basis of source LUN size: 50 GB
- Estimated change rate: 20% = 10 GB
- Minimum number of reserved LUNs: 100
- Extra reserved LUNs to ensure that larger source LUNs get enough reserved LUN space: 2 x minimum

This would translate to 200 reserved LUNs that are each 10 GB

Example for optimizing for max source LUNs

The goal is to create 4 sessions each on 100 source LUNs, where the largest is 100 GB, and the smallest is 50 GB:

- Basis of source LUN size: 1 TB
- Estimated change rate: 4 x 20% = 800 GB
- Minimum number of reserved LUNs: = 100
- Extra reserved LUNs to ensure that larger source LUNs get enough reserved LUN space: + 20% = 20 extra reserved LUNs

This would translate to 120 reserved LUNs that are each 80 GB

reserved -lunpool -addlun

Adds a LUN to the reserved LUN pool

PREREQUISITES

For **naviseccli**, you must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **naviseccli reserved** command with the **-lunpool** and **-addlun** functions adds one or more LUNs to the reserved LUN pool. Each system has its own reserved LUN pool, and before starting a replication session, the reserved LUN pool must contain at least one LUN for each source LUN that will be participating in a session.

Note: This command does not support the thin LUNs.

Replication sessions include SnapView sessions and any reserved sessions for use in another application, such as incremental SAN Copy and MirrorView/A.

The software allocates reserved LUNs on a per source LUN basis. Each system manages its own reserved LUN pool space and allocates reserved LUNs on a per-source LUN basis, not a per-session basis.

Note: You must bind the LUN before you can add it to the reserved LUN pool. While a LUN is part of the reserved LUN pool, you cannot use it for any other purpose.

SYNTAX

reserved -lunpool -addlun *lun_numbers*

OPTIONS

lun_numbers

Specifies the logical unit number(s) to add to the reserved LUN pool.

EXAMPLE

For ss1_spa, this command adds the LUN with ID 11 to the system's reserved LUN pool.

```
naviseccli -h ss1_spa reserved -lunpool -addlun 11
```

OUTPUT

If the version of software running on the SP does not support this command, the following error message is printed to `stderr`: `Command is not supported`

reserved -lunpool -list

Displays reserved LUN pool information

PREREQUISITES

For **naviseccli**, you must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **naviseccli reserved** command with the **-lunpool** and **-list** functions and no other switches lists all information about the reserved LUN pool. You can obtain more specific information with function switches.

Note: This command does not support the thin LUNs.

SYNTAX

reserved -lunpool -list [**-allocatedluns**] [**-chunksize**] [**-freeluncount**] [**-freeluns**] [**-freesize**] [**-luncount**] [**-percentused**] [**-size**] [**-used**]

OPTIONS

-allocatedluns

Displays the LUN IDs of all allocated LUNs in the reserved LUN pool.

-chunksize

Displays the number of disk blocks in the reserved LUN pool, in KB. The chunk size applies to the entire system.

-freeluncount

Displays the total number of unallocated LUNs in the reserved LUN pool.

-freeluns

Displays the LUN IDs of all unallocated LUNs in the reserved LUN pool.

-freesize

Displays the total size of unallocated LUNs in GBs.

-luncount

Displays the total number of LUNs in the reserved LUN pool. You can add LUNs with the **reserved -lunpool -addlun** functions.

-percentused

Displays the percentage of the reserved LUN pool that is used.

-size

Displays the size of the reserved LUN pool in GBs.

-used

Displays the space used in the reserved LUN pool, in GBs.

EXAMPLE

This command displays the system's reserved LUN pool information. A sample output follows.

```
naviseccli -h ss1_spa reserved -lunpool -list
```

OUTPUT

The following output samples show devices controlled by one agent. Actual output varies depending on the command switches you use with the **-lunpool -list** command.

Note: If your system is running Navisphere CLI version 6.24 or later, reserved LUN pool information will be displayed for the enitre system, regardless of the SP you direct the command to. If your system is running Navisphere CLI version 6.22 or earlier, reserved LUN pool information will be displayed for the SP you direct the command to.

---

naviseccli ouput:

```
Name of the SP:                          GLOBAL
Total Number of LUNs in Pool:            6
Number of Unallocated LUNs in Pool:      4
Unallocated LUNs:                        14, 24, 23, 22
Total size in GB:                        4.488281
Unallocated size in GB:                  1.292969
Used LUN Pool in GB:                     0.017639
% Used of LUN Pool:                      0.393005
Chunk size in disk blocks:               128
Allocated LUN Pool:
Target LUN:                              2
Allocated LUNs:                          249
Lun Pool LUN % Used:                     91.852825
Allocated LUNs:                          250
Lun Pool LUN % Used:                     0
```

If the version of software running on the SP does not support this command, a **`Command is not supported`** error message is printed to `stderr`.

reserved -lunpool -rmlun

Removes one or more LUNs from the reserved LUN pool

PREREQUISITES

For **naviseccli**, you must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **naviseccli reserved** command with the **-lunpool** and **-rmlun** functions removes one or more LUNs from the reserved LUN pool. If you omit the override option, the CLI prompts for confirmation before removing the LUN from reserved LUN pool.

Note: This command does not support the thin LUNs.

SYNTAX

reserved -lunpool -rmlun *luns* [**-o**]

OPTIONS

-o

Executes the command without prompting for confirmation.

-rmlun *luns*

Specifies the LUN ID of each LUN, with the IDs separated by blanks, you want to remove from the reserved LUN pool.

EXAMPLE

For ss1_spa, this command starts removing LUN 42 from the system's reserved LUN pool. The software asks for confirmation:

```
naviseccli -h  ss1_spa reserved-lunpool -rmlun 42
Do you really want to remove the luns from LUN pool.
(y/n)[N]?
y
```

OUTPUT

If the version of software running on the SP does not support this command, a **`Command is not supported`** error message is printed to `stderr`.

iSCSI and FCoE commands

This section explains each of the naviseccli Internet SCSI (iSCSI) and Fibre Channel over Ethernet (FCoE) commands, that is, the CLI commands that are common to all iSCSI systems and FCoE ports.

About iSCSI systems in IP networks

An Internet SCSI (iSCSI) system, such as the CX500i, connects directly to an IP network. Servers with either iSCSI HBAs (host bus adapters) or Ethernet connections can access the iSCSI system through an IP network, such as a local area network (LAN).

A LAN is a set of point-to-point connections between nodes, with each node having its own unique IP address. Connections are made through one or more network components such as switches or hubs. Nodes are connected through a LAN by Ethernet CAT 6 (for Gigabit Ethernet LAN) and Active TwinAX (for 10 Gigabit Ethernet LAN) copper cables. Network switches are not nodes.

Each node in an iSCSI environment is either an initiator (server) or a target (system). Figure 5 on page 392 shows an initiator node and a target node.

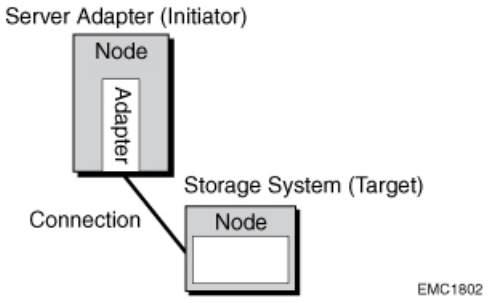


Figure 5. Initiator and target nodes

Before a server is able to initiate server I/O to the iSCSI system, it must be configured as follows:

- You have installed one of the following interface cards and relevant drivers:
  - Supported iSCSI HBA cards that have a driver and configuration tool (for example, QLogic), or
  - Gigabit Ethernet Network Interface Cards (NICs) running Microsoft software that provides HBA functionality.

  Note: We support 1 Gigabit and 10 Gigabit Ethernet (GigE) interfaces for iSCSI, but the system supports only 1000 Mb. If your NIC does not run GigE, then you need to connect to the system using a GigE router or switch.

- You have cabled the system properly (refer to the setup guide that shipped with the system).
- You have installed the Unisphere utilities on each server with access to data on the system (refer to the setup guide).
- You have installed PowerPath software on the servers for multi-pathing (refer to the setup guide).
- You have set the network parameters and security for the SP management ports on the system.

The iSCSI interface uses CHAP (Challenge Handshake Authentication Protocol) to protect the system's iSCSI ports from unwanted access. CHAP is optional, but if your system might be accessed from a public IP network, we strongly recommend that you use CHAP security.

CHAP is a method for authenticating iSCSI users (initiators and targets). The iSCSI system can use CHAP to authenticate server initiators and initiators can authenticate targets such as the system. To use CHAP security, you must configure CHAP credentials for the system iSCSI ports and any servers that will access the system data.

Note: If you will be using CHAP security, we strongly recommend that you configure it on both the system and the server before initiating server I/O.

Figure 6 on page 393 illustrates an iSCSI system in a storage domain with various servers and illustrates how iSCSI systems differ from Fibre Channel systems.

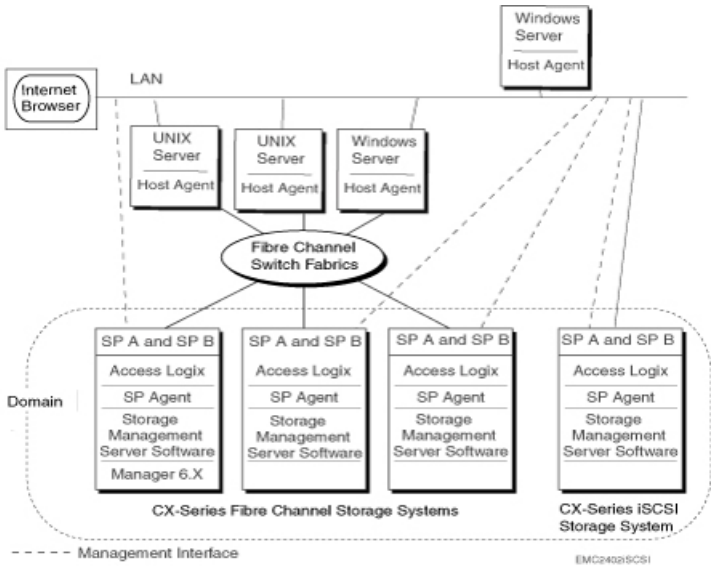


Figure 6. Fibre Channel and iSCSI systems in an IP network

Using iSNS within an iSCSI storage environment

Note: iSNS (Internet Storage Naming Service) is supported only on Windows platforms that are part of an iSCSI network configuration.

The iSNS service provides the same function for TCP/IP storage networks as the Simple Name Server (SNS) service in a Fibre Channel fabric — automated discovery, management and configuration of iSCSI devices. It eliminates the need to manually configure each individual storage device with its own list of initiators and targets. Once configured, the iSNS server assumes responsibility for the discovery and management of iSCSI devices.

The iSNS service includes an iSNS server component and iSNS client components. The iSNS server must reside somewhere within the IP storage network, for example, in the switch firmware, or on a host. An iSNS client resides on both the iSCSI system and any iSCSI hosts connected to the system. When you start the system, the iSNS client on the system gathers all the system's iSCSI port information and stores it locally on the system. When you add a server to the system's iSNS configuration, Unisphere establishes a connection from the system to the iSNS server, and then registers all the stored information on the system with the iSNS server.

To use the features of the iSNS service in an iSCSI storage environment:

- All the iSCSI requirements listed in About iSCSI systems in IP networks on page 392 must be met.
- An iSNS server must be running on a network to which the system has access.
- The host initiators or HBAs must be able to use the iSNS service.
- The system must support the iSNS service.
- The iSNS server must be able to communicate with the system.

Figure 7 on page 395 represents a sample iSNS configuration. In this configuration, the management and storage networks are separate. The management station is used to configure both the iSNS servers and the system (using Unisphere). The iSNS servers are also connected to the storage network so that the clients may query them for target information. The system

uses either the storage or the management network to register its targets (ports) with the iSNS servers.

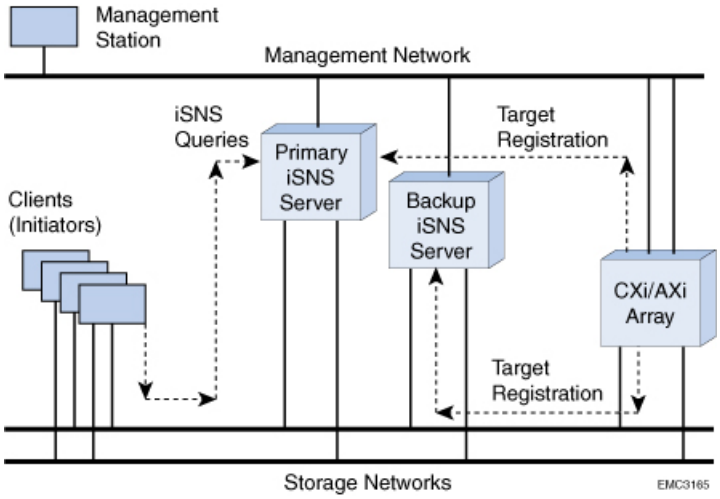


Figure 7. Sample iSNS storage configuration

iSCSI commands overview

The naviseccli iSCSI commands in this section include the connection and iSNS commands. Table 6 on page 395 identifies the iSCSI commands that can be used.

Table 6. naviseccli iSCSI commands

Command	Description
CHAP User Commands	
connection -adduser	Creates a CHAP user account.
connection -deleteuser	Deletes a CHAP user account.
connection -getuser	Displays CHAP user accounts.
Port administration commands	
connection -getport	Retrieves a specific iSCSI or FCOE port or the list of all the iSCSI or FCoE ports.
connection -setport	Modifies the properties of a connection port.
connection -delport	Deletes a virtual port.
connection -route	Sets up the static routes.
connection -pingnode	Verifies that packets reach a destination node without errors.

Table 6. naviseccli iSCSI commands *(continued)*

Command	Description
connection -traceroute	Displays the route that a packet takes to a destination node.
Connection set database commands	
connection -set-sharedauth	Sets a username and secret for the system's shared credentials record.
connection -delsharedauth	Removes the shared authentication information from the system.
connection -get-sharedauth	Displays the username and the switch enabled for the shared authentication record.
connection -addset	Adds a connection set.
connection -delset	Deletes a connection set and associated connection paths.
connection -modifyset	Modifies parameters of the connection set.
connection -getset	Lists a specific connection set or all the connection sets.
connection -addpath	Adds a connection path to a specific connection set.
connection -delpath	Deletes a connection path from a connection set.
connection -modifypath	Modifies a connection path from a connection set.
connection -verifypath	Tests a connection path from a connection set.
iSNS commands	
isns -addserver	Adds an iSNS server to a system's iSNS service configuration.
isns -deleteserver	Deletes an iSNS server from a system's iSNS service configuration.
isns -listserver	Displays all iSNS servers that are configured in the system's iSNS service.
isns -setprimary	Sets a configured iSNS server as the primary server for a system's iSNS service configuration.

connection -adduser

Adds a CHAP authentication user

PREREQUISITES

You must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **naviseccli connection** command with the **-adduser** function adds either an initiator CHAP authentication user or a target (system) CHAP authentication user to the system CHAP user database.

Note: If you try to create a CHAP user for an initiator and the user is already defined, an error message is returned that the user is already defined for the initiator.

If you try to add a user for a target and the user is already defined, an error is returned that only one user can be defined for target access.

SYNTAX

connection -adduser -definedFor target initiator | **-initiatorName** *initiatorName* | ANY [**-userName** *userName*] **-secret** *secret* [**-hexsecret**] [**-o**]

OPTIONS

-definedFor initiator | **target**

initiator adds an initiator CHAP user account to the system user database. If you specify initiator, you must specify an initiator using the **-initiatorName** parameter. Target specifies that a target (system) CHAP user account will be created. If you specify target, do not use the -initiatorName parameter.

-initiatorName *initiatorName*

If initiator user account data is being added, initiatorName is a unique identifier for the initiator and uses the iSCSI Qualified Name (IQN) of the iSCSI initiator. This parameter is required if you are defining an initiator user.

-userName *username*

If initiator user account data is being added, username specifies the CHAP username that the initiator uses when connecting to an iSCSI target. For CHAP, a username and secret must be defined for each initiator. If the -userName parameter is omitted, it defaults to the -initiatorName value. If a target is being configured for mutual CHAP, the target name becomes the username.

-secret *secret*

If initiator user account data is being added, secret specifies the CHAP secret (password) that the system will use to authenticate the initiator. You can specify the secret in ASCII or hexadecimal characters (see the -hexsecret switch that follows). By default, -secret is an ASCII string. ASCII secrets must consist of at least 12 and no more than 16 characters. Hexadecimal secrets must consist of at least 12 and no more than 16 pairs of data (24 to 32 characters).

-hexsecret

If initiator user account data is being added, including the -hexsecret parameter specifies that -secret is a hexadecimal value.

-o

Executes the command without prompting for confirmation. If you include the **-o** switch, you will not be prompted to confirm that you want to add the user account data. If you do not use the -o switch, you will be prompted to confirm that you want to add the user.

EXAMPLE

The following example adds a user account to the system database.

```
naviseccli connection -adduser -definedfor initiator  -initiatorName
5.com.microsoft:cpc7745 -username Guest -secret 1234567890123456

Adding an iSCSI user account with the following
attributes:
Initiator Name: iqn.1991-05.com.microsoft:cpc7745
User name: Guest
Secret: 1234567890123456
Defined For: initiator
Do you really want to perform this action (y/n)? y
```

connection -deleteuser

Deletes a CHAP authentication user

PREREQUISITES

You must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **naviseccli connection** command with the **-deleteuser** function deletes a specified initiator or target CHAP authentication user from the system CHAP user database.

SYNTAX

```
connection -deleteuser -definedFor  initiator | target -initiatorName initiatorName
-userName username
[-o]
```

OPTIONS

-definedFor initiator | target

initiator specifies that an initiator user account will be deleted from the system user database. If you specify initiator, you must specify an initiator using the **-initiatorName** parameter. target specifies that the target (system) user data will be deleted.

-initiatorName *initiatorName*

If **initiator** user account data is being deleted, initiatorName is the name that was assigned for the initiator when the user account was created. The default initiator name is the IQN of the initiator.

-userName *username*

Specifies the iSCSI CHAP username for the initiator or target user being deleted.

-o

Executes the command without prompting for confirmation. If you include the **-o** switch, you will not be prompted to confirm the user account deletion. If you do not use the -o switch, you will be prompted to confirm that you want to delete the user account data.

EXAMPLE

The following example deletes a user account from the system:

```
naviseccli connection -deleteuser -definedfor initiator
-initiatorName iqn.1991-05.com.microsoft:cpc7745 -username Guest

Deleting an iSCSI user account with the following
attributes:
Initiator Name: iqn.1991-05.com.microsoft:cpc7745
User name: Guest
Defined For: initiator
Do you really want to perform this action (y/n)? y
```

OUTPUT

None if the command succeeds; status or error information if it fails.

connection -getuser

Display CHAP authentication user data

PREREQUISITES

You must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **naviseccli connection** command with the **-getuser** function displays CHAP authentication user account data that is configured on the system. If no arguments are specified, all CHAP users defined on the system are displayed. Use **-definedFor**, **-initiatorName**, and **-userName** to display information for a specified user. If you specify a particular user and that user is not found, the error message,

```
The specified user account does not exist,
```

is returned.

SYNTAX

connection -getuser [**-definedFor initiator** | **target**] [**-userName** *userName*] [**-initiatorName** *initiatorName*]

OPTIONS

-definedFor initiator | **target**

initiator specifies that information for a CHAP initiator user is displayed. If you specify initiator, you must include the **-userName** and **-initiatorName**.

target specifies that information for a CHAP target user (the system user account) is displayed. If you specify target, you must include the **-userName**.

-initiatorName *initiatorName*

The initiator is the host or HBA that initiates the connection with the target system. The initiator is identified by the IQN of the iSCSI initiator.

-userName *username*

Specifies the iSCSI CHAP username for the initiator or target user being specified by **initiatorName**.

EXAMPLE

The following example gets information on the current user:

```
naviseccli connection -getuser
```

OUTPUT

```
Initiator Name:  iqn.1991-05.com.microsoft:cpc7745
User Name:  Guest
Defined For:  initiator
```

connection -getport

Retrieve a specific iSCSI or FCoE port or the list of all the iSCSI or FCoE ports

PREREQUISITES

You must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **naviseccli connection** command with the **-getport** function displays information about either a specified iSCSI port or a list of all iSCSI ports. If no arguments are specified, all of the iSCSI ports defined on the targeted system are displayed.

If a change in settings is requested, a confirmation is displayed.

The **-sp** and the **-portid** parameters select which iSCSI ports are displayed. If both options are specified, a particular iSCSI port is specified. If either or both of the options are omitted, all iSCSI ports that meet the search criteria are displayed.

SYNTAX

connection -getport [**-sp a**|**b**] [**-portid** *portid* [**-vportid** *vportid*]] [**-vlanid**] [**-address** *IPAddress*] [**-subnetmask**] [**-gateway**] [**-initiatorAuthentication**] [**-mac**] [**-mtu**] [**-flowctl**] [**-hostWindow**] [**-replicationWindow**] [**-all**]

OPTIONS

-sp a|**b**

Specifies SP A or B. Displays the information for iSCSI or FCoE ports configured on the specified SP.

-portid *portid*

Specifies an iSCSI or FCoE port ID. Displays information only for the specified iSCSI port.The following parameters, **-address**, **-subnetmask**, **-gateway**, and **-initiatorAuthentication**, define additional information that is displayed for iSCSI ports. If none of these options is specified, all fields are displayed. The SP and port ID fields are always displayed.

-address

Displays the IP address of the specified iSCSI ports. The address is a 32-bit numeric address written as four 8-bit numbers (0-255) separated by periods (called the quad-dotted notation). For example, 165.152.36.35.

-subnetmask

Displays the network mask for the specified iSCSI ports. The subnet mask uses the quad-dotted notation. For example, 255.255.255.0.

-gateway

Displays the network gateway address that the specified iSCSI ports use. The gateway address uses the quad-dotted notation. For example, 165.152.35.22.

-initiatorAuthentication

Displays the state of the initiator authentication flag for the specified iSCSI ports. **True** indicates that initiator authentication is turned on for the port and that all initiators logging into that port will be required to authenticate against the target system. **False** indicates that initiator authentication has been disabled for the port.

-mac

Displays the MAC address for the front-end ports of an iSCSI system and also FCoE ports. Running the **port ... -mac** command returns a MAC *Address* field for each port. When you run the **port ... -mac** command, if any ports are Fibre Channel ports, the MAC *Address* field for those ports will be displayed as `Not Applicable`

-mtu

Displays the port's MTU settings and lists the valid MTU settings for the portal.

-vlanid

Displays the virtual LAN (VLAN) ID of the specified virtual port.

-vportid *vportid*

Displays information for the specified virtual port ID.

-flowctl

Determines the flow control settings. Valid values are Auto, Transmit flow control (Tx), Receive flow control (Rx).

-hostWindow

Sets the receive window size for host-to-system traffic. The available window sizes are 64K, 128K, 256K, 512K, 1MB. The default value is 256K.

replicationWindow

Sets the receive window size for system-to-system traffic. The available window sizes are 64K, 128K, 256K, 512K, 1MB. The default value is 256K.

-all

Displays all the physical and virtual port information for each iSCSI port.

EXAMPLE # 1

```
naviseccli connection -getport
```

```
SP:  A
Port ID:  4
Port WWN:  iqn.1992-04.com.emc:cx.apm00093300877.a4
iSCSI Alias:  0877.a4
IP Address:  172.20.1.140
Subnet Mask:  255.255.255.0
Gateway Address:  172.20.1.1
Initiator Authentication:  Not Available

SP:  A
Port ID:  5
Port WWN:  iqn.1992-04.com.emc:cx.apm00093300877.a5
iSCSI Alias:  0877.a5

SP:  A
Port ID:  6
Port WWN:  iqn.1992-04.com.emc:cx.apm00093300877.a6
iSCSI Alias:  0877.a6
IP Address:  172.20.2.140
Subnet Mask:  255.255.255.0
Gateway Address:  172.20.2.1
Initiator Authentication:  Not Available

SP:  A
Port ID:  7
Port WWN:  iqn.1992-04.com.emc:cx.apm00093300877.a7
iSCSI Alias:  0877.a7

SP:  B
Port ID:  4
Port WWN:  iqn.1992-04.com.emc:cx.apm00093300877.b4
iSCSI Alias:  0877.b4
IP Address:  172.20.1.141
Subnet Mask:  255.255.255.0
Gateway Address:  172.20.1.1
Initiator Authentication:  Not Available

SP:  B
Port ID:  5
Port WWN:  iqn.1992-04.com.emc:cx.apm00093300877.b5
iSCSI Alias:  0877.b5

SP:  B
Port ID:  6
Port WWN:  iqn.1992-04.com.emc:cx.apm00093300877.b6
iSCSI Alias:  0877.b6
IP Address:  172.20.2.141
Subnet Mask:  255.255.255.0
Gateway Address:  172.20.2.1
Initiator Authentication:  Not Available

SP:  B
Port ID:  7
Port WWN:  iqn.1992-04.com.emc:cx.apm00093300877.b7
iSCSI Alias:  0877.b7

SP:  B
Port ID:  9
Port WWN:  50:06:01:60:BB:20:13:0D:50:06:01:69:3B:24:13:0D
iSCSI Alias:  N/A
IP Address:  N/A
Subnet Mask:  N/A
```

```
Gateway Address:  N/A
Initiator Authentication:  N/A

SP:  A
Port ID:  8
Port WWN:  50:06:01:60:BB:20:13:0D:50:06:01:60:3B:24:13:0D
iSCSI Alias:  N/A
IP Address:  N/A
Subnet Mask:  N/A
Gateway Address:  N/A
Initiator Authentication:  N/A

SP:  A
Port ID:  9
Port WWN:  50:06:01:60:BB:20:13:0D:50:06:01:61:3B:24:13:0D
iSCSI Alias:  N/A
IP Address:  N/A
Subnet Mask:  N/A
Gateway Address:  N/A
Initiator Authentication:  N/A

SP:  B
Port ID:  8
Port WWN:  50:06:01:60:BB:20:13:0D:50:06:01:68:3B:24:13:0D
iSCSI Alias:  N/A
IP Address:  N/A
Subnet Mask:  N/A
Gateway Address:  N/A
Initiator Authentication:  N/A
```

EXAMPLE # 2

```
naviseccli connection -getport -sp a -portid 8


SP:  A
Port ID:  8
Port WWN:  50:06:01:60:BB:20:13:0D:50:06:01:68:3B:24:13:0D
iSCSI Alias:  N/A
IP Address:  N/A
Subnet Mask:  N/A
Gateway Address:  N/A
Initiator Authentication:  N/A
```

EXAMPLE # 3

```
naviseccli connection -getport -sp a -portid 8 –vlanid


SP:  A
Port ID:  8
Port WWN:  50:06:01:60:BB:20:13:0D:50:06:01:60:3B:24:13:0D
iSCSI Alias:  N/A
Virtual Port ID:  0
VLAN ID:  101
```

EXAMPLE # 4

```
naviseccli connection -getport -sp a -portid 8 –mtu


SP:  A
Port ID:  8
Port WWN:  50:06:01:60:BB:20:13:0D:50:06:01:60:3B:24:13:0D
iSCSI Alias:  N/A
IP Address:  N/A
Subnet Mask:  N/A
Gateway Address:  N/A
Initiator Authentication:  N/A
Current MTU:  2240
Available MTU Sizes:  "2240"?
```

EXAMPLE # 5

```
naviseccli connection -getport -portid 8 -speed


SP:  A
Port ID:  8
Port WWN:  50:06:01:60:BB:20:13:0D:50:06:01:60:3B:24:13:0D
iSCSI Alias:  N/A
IP Address:  N/A
Subnet Mask:  N/A
Gateway Address:  N/A
Initiator Authentication:  N/A
Port Speed:  10000 Mb
Auto-Negotiate:  No
Available Speeds:  10000 Mb
```

EXAMPLE # 6

```
naviseccli connection -getport -sp a -portid 8 -vportid 0 -all


SP:  A
Port ID:  8
Port WWN:  50:06:01:60:BB:20:13:0D:50:06:01:60:3B:24:13:0D
iSCSI Alias:  N/A
Port Speed:  10000 Mb
Auto-Negotiate:  No
Available Speeds:  10000 Mb
Current MTU:  2240
Available MTU Sizes:  "2240"

Virtual Port ID:  0
VLAN ID:  101
IP Address:  N/A
Subnet Mask:  N/A
Gateway Address:  N/A
Initiator Authentication:  N/A
```

EXAMPLE # 7

```
naviseccli connection -getport –mac
```

```
SP:  A
Port ID:  4
Port WWN:  iqn.1992-04.com.emc:cx.apm00093300877.a4
iSCSI Alias:  0877.a4
Port Speed:  1000 Mb
Auto-Negotiate:  Yes
Available Speeds:  10 Mb
-                :  100 Mb
-                :  1000 Mb
-                :  Auto
Current MTU:  1500
Available MTU Sizes:
"1260","1448","1500","1548","2000","2450","3000","4000","4080","4470","5000","6000","7000","8000","9000"

Virtual Port ID:  0
VLAN ID:  Disabled
IP Address:  172.20.1.140
Subnet Mask:  255.255.255.0
Gateway Address:  172.20.1.1
Initiator Authentication:  Not Available

SP:  A
Port ID:  5
Port WWN:  iqn.1992-04.com.emc:cx.apm00093300877.a5
iSCSI Alias:  0877.a5
Port Speed:  0 Mb
Auto-Negotiate:  Yes
Available Speeds:  10 Mb
-                :  100 Mb
-                :  1000 Mb
-                :  Auto
Current MTU:  0
Available MTU Sizes:
"1260","1448","1500","1548","2000","2450","3000","4000","4080","4470","5000","6000","7000","8000","9000"

SP:  A
Port ID:  6
Port WWN:  iqn.1992-04.com.emc:cx.apm00093300877.a6
iSCSI Alias:  0877.a6
Port Speed:  10000 Mb
Auto-Negotiate:  No
Available Speeds:  10000 Mb
Current MTU:  1500
Available MTU Sizes:
"1260","1448","1500","1548","2000","2450","3000","4000","4080","4470","5000","6000","7000","8000","9000"

Virtual Port ID:  0
VLAN ID:  Disabled
IP Address:  172.20.2.140
Subnet Mask:  255.255.255.0
Gateway Address:  172.20.2.1
Initiator Authentication:  Not Available

SP:  A
Port ID:  7
Port WWN:  iqn.1992-04.com.emc:cx.apm00093300877.a7
iSCSI Alias:  0877.a7
Port Speed:  0 Mb
Auto-Negotiate:  No
Available Speeds:  10000 Mb
Current MTU:  1500
```

```
Available MTU Sizes:
"1260","1448","1500","1548","2000","2450","3000","4000","4080","4470","5000","6000","7000","8000","9000"

SP:  B
Port ID:  4
Port WWN:  iqn.1992-04.com.emc:cx.apm00093300877.b4
iSCSI Alias:  0877.b4
Port Speed:  1000 Mb
Auto-Negotiate:  Yes
Available Speeds:  10 Mb
-                :  100 Mb
-                :  1000 Mb
-                :  Auto
Current MTU:  1500
Available MTU Sizes:
"1260","1448","1500","1548","2000","2450","3000","4000","4080","4470","5000","6000","7000","8000","9000"

Virtual Port ID:  0
VLAN ID:  Disabled
IP Address:  172.20.1.141
Subnet Mask:  255.255.255.0
Gateway Address:  172.20.1.1
Initiator Authentication:  Not Available

SP:  B
Port ID:  5
Port WWN:  iqn.1992-04.com.emc:cx.apm00093300877.b5
iSCSI Alias:  0877.b5
Port Speed:  0 Mb
Auto-Negotiate:  Yes
Available Speeds:  10 Mb
-                :  100 Mb
-                :  1000 Mb
-                :  Auto
Current MTU:  0
Available MTU Sizes:
"1260","1448","1500","1548","2000","2450","3000","4000","4080","4470","5000","6000","7000","8000","9000"

SP:  B
Port ID:  6
Port WWN:  iqn.1992-04.com.emc:cx.apm00093300877.b6
iSCSI Alias:  0877.b6
Port Speed:  10000 Mb
Auto-Negotiate:  No
Available Speeds:  10000 Mb
Current MTU:  1500
Available MTU Sizes:
"1260","1448","1500","1548","2000","2450","3000","4000","4080","4470","5000","6000","7000","8000","9000"

Virtual Port ID:  0
VLAN ID:  Disabled
IP Address:  172.20.2.141
Subnet Mask:  255.255.255.0
Gateway Address:  172.20.2.1
Initiator Authentication:  Not Available

SP:  B
Port ID:  7
Port WWN:  iqn.1992-04.com.emc:cx.apm00093300877.b7
iSCSI Alias:  0877.b7
Port Speed:  0 Mb
Auto-Negotiate:  No
```

```
Available Speeds:  10000 Mb
Current MTU:  1500
Available MTU Sizes:
"1260","1448","1500","1548","2000","2450","3000","4000","4080","4470","5000","6000","7000","8000","9000"

SP:  B
Port ID:  9
Port WWN:  50:06:01:60:BB:20:13:0D:50:06:01:69:3B:24:13:0D
iSCSI Alias:  N/A
Enode MAC Address:  00-60-16-3B-47-B3
Port Speed:  10 Gb
Auto-Negotiate:  No
Available Speeds:  10 Gb
Current MTU:  2240
Available MTU Sizes:  "2240"

Virtual Port ID:  0
VLAN ID:  666
IP Address:  N/A
Subnet Mask:  N/A
Gateway Address:  N/A
Initiator Authentication:  N/A
VN_Port MAC Address:  0E-FC-00-68-00-03

SP:  A
Port ID:  8
Port WWN:  50:06:01:60:BB:20:13:0D:50:06:01:60:3B:24:13:0D
iSCSI Alias:  N/A
Enode MAC Address:  00-60-16-3B-55-42
Port Speed:  0 Gb
Auto-Negotiate:  No
Available Speeds:  10 Gb
Current MTU:  2240
Available MTU Sizes:  "2240"

Virtual Port ID:  0
VLAN ID:  N/A
IP Address:  N/A
Subnet Mask:  N/A
Gateway Address:  N/A
Initiator Authentication:  N/A
VN_Port MAC Address:  00-00-00-00-00-00

SP:  A
Port ID:  9
Port WWN:  50:06:01:60:BB:20:13:0D:50:06:01:61:3B:24:13:0D
iSCSI Alias:  N/A
Enode MAC Address:  00-60-16-3B-55-43
Port Speed:  10 Gb
Auto-Negotiate:  No
Available Speeds:  10 Gb
Current MTU:  2240
Available MTU Sizes:  "2240"

Virtual Port ID:  0
VLAN ID:  666
IP Address:  N/A
Subnet Mask:  N/A
Gateway Address:  N/A
Initiator Authentication:  N/A
VN_Port MAC Address:  0E-FC-00-68-00-04
```

```
SP:  B
Port ID:  8
Port WWN:  50:06:01:60:BB:20:13:0D:50:06:01:68:3B:24:13:0D
iSCSI Alias:  N/A
Enode MAC Address:  00-60-16-3B-47-B2
Port Speed:  0 Gb
Auto-Negotiate:  No
Available Speeds:  10 Gb
Current MTU:  2240
Available MTU Sizes:  "2240"

Virtual Port ID:  0
VLAN ID:  N/A
IP Address:  N/A
Subnet Mask:  N/A
Gateway Address:  N/A
Initiator Authentication:  N/A
VN_Port MAC Address:  00-00-00-00-00-00
```

EXAMPLE # 8

```
naviseccli connection -getport -sp a -portid 8 -vportid 0 -mac


SP:  A
Port ID:  8
Port WWN:  50:06:01:60:BB:20:13:0D:50:06:01:60:3B:24:13:0D
iSCSI Alias:  N/A
Port Speed:  10000 Mb
Auto-Negotiate:  No
Available Speeds:  10000 Mb
Enode MAC Address: 00:60:16:32:12:5B

Virtual Port ID:  0
VLAN ID:  101
IP Address:  N/A
Subnet Mask:  N/A
Gateway Address:  N/A
Initiator Authentication:  N/A
VN_Port MAC Address: 0E:FC:00:2B:0B:04
```

EXAMPLE # 9

```
naviseccli -h peregrine-spa connection -getport -sp a -mac -all
SP:  A
Port ID:  9
Port WWN:  50:06:01:60:BB:20:13:0D:50:06:01:61:3B:24:13:0D
iSCSI Alias:  N/A
Enode MAC Address:  00-60-16-3B-55-43
Port Speed:  10 Gb
Auto-Negotiate:  No
Available Speeds:  10 Gb
Current MTU:  2240
Available MTU Sizes:  "2240"

Virtual Port ID:  0
VLAN ID:  666
IP Address:  N/A
Subnet Mask:  N/A
Gateway Address:  N/A
Initiator Authentication:  N/A
VN_Port MAC Address:  0E-FC-00-68-00-04
```

EXAMPLE # 10

```
naviseccli -h peregrine-spa connection -getport -flowctl -hostWindow
-replicationWindow


Flow Control:  Auto
Host Window:  256K
Replication Window:  256K
Available Window Sizes:  64K,128K,256K,512K,1MB
```

OUTPUT

The following sample output shows several virtual ports assigned with the VLAN tags:

```
naviseccli -h peregrine_spa connection -getport -sp a -portid 0 -all
SP:  A
Port ID:  4
Port WWN:  iqn.1992-04.com.emc:cx.apm00093300877.a4
iSCSI Alias:  0877.a4
Port Speed:  1000 Mb
Auto-Negotiate:  Yes
Available Speeds:  10 Mb
-                :  100 Mb
-                :  1000 Mb
-                :  Auto
Current MTU:  1500
Available MTU Sizes:
"1260","1448","1500","1548","2000","2450","3000","4000","4080","4470","5000","6000","7000","8000","9000"
Flow Control:  Auto
Host Window:  256K
Replication Window:  256K
Available Window Sizes:  64K,128K,256K,512K,1MB

Virtual Port ID:  0
VLAN ID:  Disabled
IP Address:  172.20.1.140
Subnet Mask:  255.255.255.0
Gateway Address:  172.20.1.1
Initiator Authentication:  Not Available

SP:  A
Port ID:  5
Port WWN:  iqn.1992-04.com.emc:cx.apm00093300877.a5
iSCSI Alias:  0877.a5
Port Speed:  0 Mb
Auto-Negotiate:  Yes
Available Speeds:  10 Mb
-                :  100 Mb
-                :  1000 Mb
-                :  Auto
Current MTU:  0
Available MTU Sizes:
"1260","1448","1500","1548","2000","2450","3000","4000","4080","4470","5000","6000","7000","8000","9000"

SP:  A
Port ID:  6
Port WWN:  iqn.1992-04.com.emc:cx.apm00093300877.a6
iSCSI Alias:  0877.a6
Port Speed:  10000 Mb
Auto-Negotiate:  No
Available Speeds:  10000 Mb
Current MTU:  1500
Available MTU Sizes:
"1260","1448","1500","1548","2000","2450","3000","4000","4080","4470","5000","6000","7000","8000","9000"
Flow Control:  Auto
Host Window:  256K
Replication Window:  256K
Available Window Sizes:  64K,128K,256K,512K,1MB

Virtual Port ID:  0
VLAN ID:  Disabled
IP Address:  172.20.2.140
Subnet Mask:  255.255.255.0
Gateway Address:  172.20.2.1
Initiator Authentication:  Not Available
```

```
SP:  A
Port ID:  7
Port WWN:  iqn.1992-04.com.emc:cx.apm00093300877.a7
iSCSI Alias:  0877.a7
Port Speed:  0 Mb
Auto-Negotiate:  No
Available Speeds:  10000 Mb
Current MTU:  1500
Available MTU Sizes:
"1260","1448","1500","1548","2000","2450","3000","4000","4080","4470","5000","6000","7000","8000","9000"

SP:  B
Port ID:  4
Port WWN:  iqn.1992-04.com.emc:cx.apm00093300877.b4
iSCSI Alias:  0877.b4
Port Speed:  1000 Mb
Auto-Negotiate:  Yes
Available Speeds:  10 Mb
-                :  100 Mb
-                :  1000 Mb
-                :  Auto
Current MTU:  1500
Available MTU Sizes:
"1260","1448","1500","1548","2000","2450","3000","4000","4080","4470","5000","6000","7000","8000","9000"
Flow Control:  Auto
Host Window:  256K
Replication Window:  256K
Available Window Sizes:  64K,128K,256K,512K,1MB

Virtual Port ID:  0
VLAN ID:  Disabled
IP Address:  172.20.1.141
Subnet Mask:  255.255.255.0
Gateway Address:  172.20.1.1
Initiator Authentication:  Not Available

SP:  B
Port ID:  5
Port WWN:  iqn.1992-04.com.emc:cx.apm00093300877.b5
iSCSI Alias:  0877.b5
Port Speed:  0 Mb
Auto-Negotiate:  Yes
Available Speeds:  10 Mb
-                :  100 Mb
-                :  1000 Mb
-                :  Auto
Current MTU:  0
Available MTU Sizes:
"1260","1448","1500","1548","2000","2450","3000","4000","4080","4470","5000","6000","7000","8000","9000"

SP:  B
Port ID:  6
Port WWN:  iqn.1992-04.com.emc:cx.apm00093300877.b6
iSCSI Alias:  0877.b6
Port Speed:  10000 Mb
Auto-Negotiate:  No
Available Speeds:  10000 Mb
Current MTU:  1500
Available MTU Sizes:
"1260","1448","1500","1548","2000","2450","3000","4000","4080","4470","5000","6000","7000","8000","9000"
Flow Control:  Auto
Host Window:  256K
```

```
Replication Window:  256K
Available Window Sizes:  64K,128K,256K,512K,1MB

Virtual Port ID:  0
VLAN ID:  Disabled
IP Address:  172.20.2.141
Subnet Mask:  255.255.255.0
Gateway Address:  172.20.2.1
Initiator Authentication:  Not Available

SP:  B
Port ID:  7
Port WWN:  iqn.1992-04.com.emc:cx.apm00093300877.b7
iSCSI Alias:  0877.b7
Port Speed:  0 Mb
Auto-Negotiate:  No
Available Speeds:  10000 Mb
Current MTU:  1500
Available MTU Sizes:
"1260","1448","1500","1548","2000","2450","3000","4000","4080","4470","5000","6000","7000","8000","9000"

SP:  B
Port ID:  9
Port WWN:  50:06:01:60:BB:20:13:0D:50:06:01:69:3B:24:13:0D
iSCSI Alias:  N/A
Port Speed:  10 Gb
Auto-Negotiate:  No
Available Speeds:  10 Gb
Current MTU:  2240
Available MTU Sizes:  "2240"
Flow Control:  Auto
Host Window:  256K
Replication Window:  256K
Available Window Sizes:  64K,128K,256K,512K,1MB

Virtual Port ID:  0
VLAN ID:  666
IP Address:  N/A
Subnet Mask:  N/A
Gateway Address:  N/A
Initiator Authentication:  N/A

SP:  A
Port ID:  8
Port WWN:  50:06:01:60:BB:20:13:0D:50:06:01:60:3B:24:13:0D
iSCSI Alias:  N/A
Port Speed:  0 Gb
Auto-Negotiate:  No
Available Speeds:  10 Gb
Current MTU:  2240
Available MTU Sizes:  "2240"
Flow Control:  Auto
Host Window:  256K
Replication Window:  256K
Available Window Sizes:  64K,128K,256K,512K,1MB

Virtual Port ID:  0
VLAN ID:  N/A
IP Address:  N/A
Subnet Mask:  N/A
Gateway Address:  N/A
Initiator Authentication:  N/A
```

```
SP:  A
Port ID:  9
Port WWN:  50:06:01:60:BB:20:13:0D:50:06:01:61:3B:24:13:0D
iSCSI Alias:  N/A
Port Speed:  10 Gb
Auto-Negotiate:  No
Available Speeds:  10 Gb
Current MTU:  2240
Available MTU Sizes:  "2240"
Flow Control:  Auto
Host Window:  256K
Replication Window:  256K
Available Window Sizes:  64K,128K,256K,512K,1MB

Virtual Port ID:  0
VLAN ID:  666
IP Address:  N/A
Subnet Mask:  N/A
Gateway Address:  N/A
Initiator Authentication:  N/A

SP:  B
Port ID:  8
Port WWN:  50:06:01:60:BB:20:13:0D:50:06:01:68:3B:24:13:0D
iSCSI Alias:  N/A
Port Speed:  0 Gb
Auto-Negotiate:  No
Available Speeds:  10 Gb
Current MTU:  2240
Available MTU Sizes:  "2240"

Virtual Port ID:  0
VLAN ID:  N/A
IP Address:  N/A
Subnet Mask:  N/A
Gateway Address:  N/A
Initiator Authentication:  N/A
```

connection -setport

Modify the properties of a port

PREREQUISITES

You must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **naviseccli connection** command with the **-setport** function modifies the properties of a specified SP port.

SYNTAX

```
connection -setport [-iscsi (Default)]
-sp a|b
-portid portid [-vportid vportid (default=0)]
[-vlanid vlanid | -vlandisable]
[-address address] [-subnetmask subnetmask] [-gateway gateway]
[-initiatorAuthentication 0|1] [-alias iscsialias] [-speed speed] [-mtu
mtu] [-flowctl auto | on | off | TxOn | RxOn] [-hostWindow windowsize]
[-replicationWindow windowsize] [-o]
```

```
connection -setport [-fcoe]
-sp a|b
-portid portid [-vportid vportid (default=0)]
[-vlanid vlanid | -vlanautodiscovery]
[-o]
```

OPTIONS

-sp a|b

Specifies that the iSCSI or FCOE port is on either SP A or SP B.

-portid *portid*

Specifies the port on the SP. For example, an SP with one port has port 1 and an SP with two ports has port 0 and port 1.

-vportid *vportid*

Specifies the virtual port ID. If you do not specify the -vportid, the system defaults to virtual port 0.

-vlanautodiscovery

Sets the port (FCoE only) specified by **-portid** to be in VLAN auto discovery mode.

-vlanid *vlanid*

Specifies the VLAN ID.

-vlandisable

Disables VLAN tagging on the virtual port.

-address *IPAddress*

Specifies the IP address of the iSCSI port. The address uses the dotted-quad format. For example: 165.152.36.35.

-subnetmask *subnetmask*

Specifies the subnetwork mask for the iSCSI port. The subnet mask uses the dotted-quad format. For example: 255.255.255.0.

-gateway *gateway*

Specifies the network gateway address that the iSCSI port uses. The gateway address uses the dotted-quad format. For example: 165.152.35.22.

-initiatorAuthentication **0**|**1**

If initiator authentication is turned on, all initiators logging in to the port must be authenticated by the system.

0 = Not required - default

1 = Required

-mtu

Configures the MTU size for the specified iSCSI port. If not specified during the initial creation of a portal, the default is 1500. If **-mtu** is not specified during the update of a portal's setting, the MTU setting will not change. If a change in settings has been requested, a confirmation will be displayed.

-flowctl **auto | on | off | TxOn | RxOn**

Determines the flow control settings. Valid values are Auto, Transmit flow control (Tx), Receive flow control (Rx).

-hostWindow *windowsize*

Sets the receive window size for host-to-system traffic. The available window sizes are 64K, 128K, 256K, 512K, 1MB. The default value is 256K.

-replicationWindow *windowsize*

Sets the receive window size for system-to-system traffic. The available window sizes are 64K, 128K, 256K, 512K, 1MB. The default value is 256K.

-o

Executes the command without prompting for confirmation. If you include the **-o** switch, the port will be set (configured) without a confirmation prompt. Without the **-o** switch, the software displays confirmation messages that you must respond to.

EXAMPLE # 1

The following example configures the network settings for the port with IP address 10.14.80.110:

```
naviseccli connection -setport -sp b -portid 0 -address -subnetmask
255.255.255.0 -gateway 10.14.80.1

Do you really want to perform this action (y/n)? y
```

EXAMPLE # 2

```
naviseccli –h 10.5.2.182 –setport –hostWindow 32K –o


Requested host window size is not valid.
Available Window Sizes:  64K, 128K, 256K, 512K, 1MB
```

OUTPUT

None if the command succeeds; status or error information if it fails.

connection -delport

Deletes a virtual port

PREREQUISITES

For naviseccli, you must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **naviseccli connection** command with the **-delport** function lets you delete a virtual port from a physical port. To execute this command, more than one virtual port should be associated with the management port.

If there is only one management port with only one virtual port, the command cannot be executed. Use of this command depends on the network provider capabilities.

SYNTAX

connection -delport -sp a|b -portid *portid* **-vportid** *vportid* [**-o**]

OPTIONS

-sp a|b

Deletes the virtual port of the specified SP. The default is the connected SP.

-portid *portid*

Specifies the iSCSI port ID. If you specify an invalid port ID, the system displays the following error:

```
Request failed. Specified iSCSI port not found.
```

-vportid *vportid*

Specifies the virtual port ID. If you specify an invalid virtual port ID, the system displays the following error message:

```
Request failed. Specified iSCSI virtual port not found.
```

-o

Executes the command without prompting for confirmation.

OUTPUT

Provides output depending on the options used.

connection -route

Sets up the static routes to specific hosts or networks

PREREQUISITES

For naviseccli, you must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **naviseccli connection** command with the **-route** function is used to set up the static routes to specific hosts or networks.

SYNTAX

```
connection -route [-sp a|b] [-portid portid |-vportid vportid]  [-add
-destination destination [-subnetmask subnetmask | -prefixlength length]
[-metric metric] [-persistent] ]
[-delete -destination destination [-subnetmask subnetmask |
-prefixlength length] ]
[-list] [-o]
```

OPTIONS

-sp a|b

Specifies the destination SP. The default is the connected SP.

-portid *portid*

The **-portid** and the **-vportid** together specify the interface associated with the route. If you do not specify the interface, the system determines it.

-vportid *vportid*

The **-portid** and the **-vportid** together specify the interface associated with the route. If you do not specify the interface, the system determines it.

-add

Adds a network route.

-destination *destination*

Specifies the IPv4/IPv6 address or hostname of the destination.

-subnetmask *netmask*

Specifies the IPv4 subnet mask value for the route entry. The default is 255.255.255.255. It is valid only for an IPv4 destination address.

-prefixlength *length*

Specifies the prefix length, that is the part of the address to compare while determining the route. The default is 128. It is valid only for an IPv6 destination address.

-metric *metric*

Determines the best route using the routing algorithm. The route with the lowest metric is preferred over another route.

-persistent

Specifies whether the route should persist across reboots.

-delete

Deletes an existing route.

-list

Displays the routes for the SP. By default, it displays the routes for the connected SP. It also displays the routes for a specific port/virtual port.

-o

Executes the command without prompting for confirmation.

OUTPUT

Provides output depending on the options used.

connection -pingnode

Verifies that packets reach a destination node without errors

PREREQUISITES

You must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **naviseccli connection** command with the **-pingnode** function transmits packets to a target node and returns a notification that the packets have reached the node without errors. The **connection -pingnode** command pings a target node from the iSCSI port. Use the **connection -pingnode** and the **connection -traceroute** commands to verify and diagnose network connectivity.

SYNTAX

connection -pingnode [**-sp a**|**b**] [[**-portid** *portid* **-vportid** *vportid*] |**-source** *sourceaddress*] **-address** *address* [**-packetSize** *packetSize*] [**-count** *count*] [**-timeouts** *timeouts*] [**-delays** *delays*]

OPTIONS

-sp a|**b**

Specifies either storage processor A or storage processor B.

-portid *portid*

Specifies the port on the SP, either 0 or 1. For example, an SP with one port has port 0 and an SP with two ports has port 0 and port 1.

-vportid *vportid*

Specifies the virtual port ID.

-address *address*

Specifies the IP address of the target node that the iSCSI port will ping. The address is a 32-bit numeric address written as four numbers separated by periods, for example, 128.221.56.52. Network names are not supported.

-packetSize *packetSize*

Specifies the size of the packets in bytes. The default is 32 bytes, the minimum is 0 bytes, and the maximum is 2048 bytes.

-count *count*

Specifies the number of pings to send. The default is 4; the minimum is 1.

-timeouts *timeouts*

Specifies the response wait timeout period in seconds. The default is 3 seconds, the minimum is 1 second, and the maximum is 15 seconds.

-delays *delays*

Specifies a delay in seconds between pings. The default is 1 second, the minimum is 1 second, and the maximum is 10 seconds.

EXAMPLE

```
naviseccli -h peregrine_spa connection -pingnode -sp a -portid 0
-vportid 0 -address 128.222.132.100
```

OUTPUT

```
Reply from 128.222.132.100:  bytes=32 time=1ms TTL=30
Reply from 128.222.132.100:  bytes=32 time=1ms TTL=30
Reply from 128.222.132.100:  bytes=32 time=1ms TTL=30
Reply from 128.222.132.100:  bytes=32 time=1ms TTL=30
```

connection -traceroute

Display the route that a packet takes to a destination node

PREREQUISITES

You must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **naviseccli connection** command with the **-traceroute** function displays the route that packets take to a target node that you specify in the command. The **connection -traceroute** command traces and displays the route from the system iSCSI port to the target node. Use the **connection -traceroute** and **connection -pingnode** commands to verify and diagnose network connectivity.

SYNTAX

```
connection -traceroute [-sp a|b] -address IPAddress [ [-portid portid
-vportid vportid] |-source sourceaddress
[-mtu| -packetSize packetSize] ]
[-timeouts timeouts] [-delays delays]
```

OPTIONS

-address *IPAddress*

Specifies the IP address of the target node that the iSCSI port will attempt to contact. The address uses the dotted-quad format, for example, 128.221.56.52. Network names are not supported.

-portid *portid*

Specifies the port on the SP, either 0 or 1. For example, an SP with one port has port 0; an SP with two ports has port 0 and port 1.

-vportid *vportid*

Specifies the virtual port ID.

-sp a|b

Specifies either SP A or SP B.

-delays *delays*

Specifies a delay in seconds between datagrams. The default is 1 second, the minimum is 1 second, and the maximum is 10 seconds.

-packetSize packetSize

Specifies the size of the echo packets in bytes. The default is 32 bytes, the minimum is 0 bytes, and the maximum is 2048 bytes.

-mtu

Performs networking diagnostics, focusing on the maximum transmission unit between the two systems. If specified, **-source** is required.

-source *sourceaddress*

Specifies the source address and is required when **-mtu** is used.

-timeouts *timeouts*

Specifies the response wait timeout period in seconds. The default is 3 seconds, the minimum is 1 second, and the maximum is 15 seconds.

EXAMPLE

The following example displays the route taken by a packet:

```
naviseccli -user a -password a -scope 0 -h ss1_spa connection -traceroute
-sp a -address -mtu -source
```

OUTPUT

```
1:  172.20.1.1  1 ms  1500 mtu
2:  10.5.1.250  1 ms  1500 mtu
```

connection -setsharedauth

Sets username and secret for the system's shared credentials record

PREREQUISITES

You must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **naviseccli connection** command with the **-setsharedauth** function sets a username and secret for the iSCSI intiator system's shared credentials record of the connection set database. The command lets you enable or disable the use of the system's shared authentication credentials.

SYNTAX

connection -setsharedauth [**-userNameuserName**][**-secret** *secret* [**-hexsecret**]] [**-enable**| **-disable**] [**-o**]

OPTIONS

-userName *userName*

Specifies the CHAP username used by the initiator when challenged by the target system. For CHAP, a username and secret must be defined.

-secret *secret*

Specifies the CHAP secret to be used with the username when challenged by the target system. You can specify the secret in ASCII or hexadecimal characters (see the **-hexsecret** switch that follows). By default, **-secret** is an ASCII string. ASCII secrets must consist of at least 12 and no more than 16 characters. Hexadecimal secrets must consist of at least 12 and no more than 16 pairs of data (24 to 32 characters).

-hexsecret

If initiator user account data is being added, including the **-hexsecret** parameter, it specifies that **-secret** is a hexadecimal value.

-enable| **-disable**

Enables or disables the use of the system's shared credentials.

-o

Executes the command without prompting for confirmation.

EXAMPLE

The following example sets a username and secret for the system's shared credentials record:

```
naviseccli connection -setsharedauth -username user1
-secret abcdefghi123 -enable -o
```

OUTPUT

None if the command succeeds; status or error information if it fails.

connection -delsharedauth

Removes the system shared authentication credentials

PREREQUISITES

You must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **naviseccli connection** command with the **-delsharedauth** function removes the username and secret from the iSCSI initiator system.

SYNTAX

```
connection -delsharedauth [-o]
```

OPTIONS

-o

Executes the command without prompting for confirmation. If you include the **-o** switch, you will not be prompted to confirm the user account deletion. If you do not use the **-o** switch, you will be prompted to confirm that you want to delete the user account data.

EXAMPLE

The following example removes the shared authentication credentials from the iSCSI initiator system:

```
connection -delsharedauth -o
```

OUTPUT

None if the command succeeds; status or error information if it fails.

connection -getsharedauth

Displays the username and status of the shared authentication for the iSCSI initiator system

PREREQUISITES

You must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **naviseccli connection** command with the **-getsharedauth** function displays the username and status of the shared authentication for the iSCSI initiator system.

SYNTAX

```
connection -getsharedauth
```

EXAMPLE

The following example displays the username and status of the shared authentication for the iSCSI initiator system:

```
connection -getsharedauth
```

OUTPUT

```
User Name: user1
Enabled: True
```

If no shared credentials are defined for the system, then the output is:

```
No system shared credentials are defined.
```

connection -addset

Adds a connection set

PREREQUISITES

You must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **naviseccli connection** command with the **-addset** function adds a connection set to the connection set database.

SYNTAX

```
connection -addset -name name [-digest none | Header | Data | Both]  [-au
thpolicy none | shared | setspecific -userName userName
-secret secret [-hexsecret]] [-o]
```

OPTIONS

-name *name*

Specifies a unique identifier for the connection set. It is an arbitrary name supplied by the administrator that indicates the specific connection set using the CLI or UI.

-digest none | Header | Data | Both

Indicates the type of digest, a data protection mechanism, which is turned on for connections established through this connection set.

Header indicates that the iSCSI packet headers have a checksum applied and verified.

Data indicates that the data portion of the iSCSI packet have a checksum applied and verified.Both indicates that both the headers and the data portion of the iSCSI packet have a checksum applied and verified.

-authpolicy none | shared | setspecific

Defines the type of authentication this connection set uses.

none specifies that no credentials are needed to connect to the target system.

shared specifies that the system shared authentication credentials are used to authenticate.

setspecific indicates that the username and secret stored as part of this connection set are used for authentication.

-userName *userName*

Specifies the CHAP username used by the initiator when challenged by the target system. For CHAP, a username and secret must be defined.

-secret *secret*

Specifies the CHAP secret to be used with the username when challenged by the target system. You can specify the secret in ASCII or hexadecimal characters (see the **-hexsecret** switch that follows). By default, **-secret** is an ASCII string. ASCII secrets must consist of at least 12 and no more than 16 characters. Hexadecimal secrets must consist of at least 12 and no more than 16 pairs of data (24 to 32 characters).

-hexsecret

If initiator user account data is being added, including the **-hexsecret** parameter specifies that **-secret** is a hexadecimal value.

-o

Executes the command without prompting for confirmation.

EXAMPLE

The following example adds a connection set to the connection set database:

```
connection -addset -name MirrorSet -authpolicy none -digest none
-o
```

OUTPUT

None if the command succeeds; status or error information if it fails.

connection -delset

Deletes a connection set and associated connection paths

PREREQUISITES

You must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **naviseccli connection** command with the **-delset** function deletes a connection set and its associated connection paths by the name of the connection set.

SYNTAX

connection -delset -name *name* [**-o**]

OPTIONS

-name *name*

Specifies a unique identifier for the connection set. It is an arbitrary name supplied by the administrator that indicates the specific connection set using the CLI or UI.

-o

Executes the command without prompting for confirmation. If you include the **-o** switch, you will not be prompted to confirm the user account deletion. If you do not use the **-o** switch, you will be prompted to confirm that you want to delete the user account data.

EXAMPLE

The following example deletes a connection set and associated connection paths using the name of the connection:

```
connection -delset -name MirrorSet -o
```

OUTPUT

None if the command succeeds; status or error information if it fails.

connection -modifyset

Modifies parameters of a connection set

PREREQUISITES

You must have a user account on the system on which you want to execute the command.

DESCRIPTION

The naviseccli connection command with the -modifyset function modifies parameters of a connection set.

Note: You cannot change the name of the connection with this command.

SYNTAX

```
connection -modifyset -name name [-digest None | Header | Data | Both]
[-authpolicy none | shared | setspecific -userName userName
-secret secret [-hexsecret] ] [-o]
```

OPTIONS

-name *name*

Specifies a unique identifier for the connection set.

-digest None | Header | Data | Both

Indicates the type of digest, which is turned on for connections established through this connection set.

Header indicates that the iSCSI packet headers have a checksum applied and verified.

Data indicates that the data portion of the iSCSI packet have a checksum applied and verified.

Both indicates that both the headers and the data portion of the iSCSI packet have a checksum applied and verified.

-authpolicy none | shared | setspecific

Defines the type of authentication this connection set uses.

none specifies that no credentials are needed to connect to the target system.

shared specifies that the system shared authentication credentials are used for authentication.

setspecific indicates that the username and secret stored as part of this connection set are used for authentication.

-userName *userName*

Specifies the CHAP username used by the initiator when challenged by the target system. For CHAP, a username and secret must be defined.

-secret *secret*

Specifies the CHAP secret to be used with the username when challenged by the target system. You can specify the secret in ASCII or hexadecimal characters (see the **-hexsecret** switch that follows). By default, **-secret** is an ASCII string. ASCII secrets must consist of at least 12 and no more than 16 characters. Hexadecimal secrets must consist of at least 12 and no more than 16 pairs of data (24 to 32 characters).

-hexsecret

If initiator user account data is being added, including the **-hexsecret** parameter specifies that **-secret** is a hexadecimal value.

-o

Executes the command without prompting for confirmation.

EXAMPLE

The following example modifies the parameters of a connection:

```
connection -modifyset -name MirrorSet -authpolicy -setspecific
-username user2 -secret Twelve2Sixteen -o
```

OUTPUT

None if the command succeeds; status or error information if it fails.

connection -getset

Lists a specific connection set or all the connection sets

PREREQUISITES

You must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **naviseccli connection** command with the **-getset** function lists a specific connection set or all the connection sets and displays the contents of each set.

SYNTAX

connection -getset [**-name** *name*]

OPTIONS

-name *name*

Specifies a unique identifier for the connection set.

EXAMPLE

The following example lists a specific connection set:

```
connection -getset -name MirrorSet
```

OUTPUT

```
Connection Set Name: MirrorSet
User Name:  username
Authentication Usage: SetSpecific
Header Digest: Disabled
Data Digest: Disabled
IP Address of Target: 192.168.0.1
Listening IP Port of Target: 3260
SP Ports: A-0 A-1 B-0 B-1
Description: any comments that were entered.
```

Sample output if the system (CX4 series) has virtual ports:

```
Connection Set Name:  tryzub_generated
User Name:  TRISHULA_MirrorViewGenerated
Authentication usage:  Setspecific
Header Digest:  Enabled
Data Digest:  Enabled
IP Address of Target:  172.20.4.146
Listening IP port of Target:  3260
SP Ports:  A-3v0 B-2v4
Description:  Path to tryzub A-1, generated for MirrorView
Listening IP port of Target:  3260
SP Ports:  B-3v1
Description:  Path to tryzub B-1, generated for MirrorView
```

connection -addpath

Adds a connection path to a specific connection set

PREREQUISITES

You must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **naviseccli connection** command with the **-addpath** function adds a connection path to a specific connection set. A connection path consists of the IP address of the target system, front-end ports used, and a comment field.

SYNTAX

connection -addpath -name *name* **-target** *address*[*:port*] [**-sp a**|**b -portid** *portid* [**-vportid** *vportid*]] [**comment** *text*] [**-o**]

OPTIONS

-name *name*

Specifies the name of the connection set to which you will add the connection path.

-target *address:port*

Specifies the IP address and listening port (default 3260) of the target system.

-sp a|**b**

Specifies the storage processor on the initiating system used for the session.

-portid *portid*

Specifies the front-end port number on the storage processor of the initiating system to be used for the session.

-vportid *vportid*

Specifies the virtual port number for the session. If you do not specify the virtual port number, then the system defaults to virtual port 0.

-comment *text*

Specifies a comment or description of the connection path.

`-o`

Executes the command without prompting for confirmation.

EXAMPLE

The following example adds a connection path to the specific connection set:

```
connection -addpath -name MirrorSet -target 123.231.1.1 -sp a
-portid 3 -comment mirrorview connection path -o
```

OUTPUT

None if the command succeeds; status or error information if it fails.

connection -delpath

Deletes a connection path from a connection set

PREREQUISITES

You must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **naviseccli connection** command with the **-delpath** function deletes a connection path from a connection set.

Note: You must have an IP address and optional port number to complete this command.

SYNTAX

connection -delpath -name *name* **-target** *address*[*:port*] [**-o**]

OPTIONS

-name *name*

Specifies the name of the connection set, which includes the path you want to delete.

-target *address:port*

Specifies the IP address and listening port (default 3260) of the target system.

-o

Standard override option. Without this option, the user is prompted to confirm intent.

EXAMPLE

The following example deletes a connection path from a connection set:

```
connection -delpath -name MirrorSet -target 123.231.1.1 -o
```

OUTPUT

None if the command succeeds; status or error information if it fails.

connection -modifypath

Modifies the parameters of a connection path

PREREQUISITES

You must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **naviseccli connection** command with the **-modifypath** function modifies the parameters of a connection path.

Note: You must have an IP address and optional port number to complete this command.

SYNTAX

connection -modifypath -name *name* **-target** *address*[*:port*] **-add -sp a**|**b** **-portid** *portid* [**-vportid** *vportid*] [**-comment** *text*] [**-o**] |

-add -comment *text* [**-o**]|

-del -sp a|**b -portid** *portid* [**-vportid** *vportid*] [**-o**]

OPTIONS

-name *name*

Specifies the name of the connection set, which includes the path you want to modify.

-target *address:port*

Specifies the IP address and listening port (default 3260) of the target system.

-sp a|**b**

Specifies the storage processor on the initiating system used for the session.

-portid *portid*

Specifies the front-end port number on the storage processor of the initiating system to be used for the session.

-vportid *vportid*

Specifies the virtual port number to be used for the session. If the virtual port number is not specified, the system defaults to virtual port 0.

-comment *text*

Specifies a new comment added to the connection path.

-o

Standard override option. Without this option, the user is prompted to confirm intent.

EXAMPLE

The following example modifies a connection path from a connection set:

```
connection -modifypath -name MirrorSet -target 23.231.1.1 -add -sp
b -portid 3 -o
```

OUTPUT

None if the command succeeds; status or error information if it fails.

connection -verifypath

Tests the parameters of a connection path

PREREQUISITES

You must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **naviseccli connection** command with the **-verifypath** function tests the parameter of a connection path.

Note: A connection set name, an IP address, and an optional port number are needed to complete this command.

SYNTAX

connection -verifypath -name *name* **-target** *address*[*:port*] [**-sp** *a*|*b* **-portid** *portid* [**-vportid** *vportid*]]

OPTIONS

-name *name*

Specifies the name of the connection set, which contains the path to verify.

-target *address:port*

Specifies the IP address and listening port (default 3260) of the target system.

-sp *a*|*b*

Specifies the storage processor on the initiating system used for the session.

-portid *portid*

Specifies the front-end port number on the storage processor of the initiating system to be used for the session.

-vportid *vportid*

Specifies the virtual port number to be used for the session. If the virtual port number is not specified, the system defaults to virtual port 0.

-o

Standard override option. Without this option, the user is prompted to confirm intent.

EXAMPLE

The following example tests a connection path from a connection set:

```
Connection -verifypath -name MirrorSet -target 23.231.1.1 -o
```

OUTPUT

```
Test/verify command for target {ipaddr[:portnum]} from
{fe port} completed successfully.
```

isns -addserver

Adds an iSNS server to a system's iSNS service configuration

PREREQUISITES

You must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **naviseccli isns** command with the **-addserver** function adds an iSNS server to a system's iSNS service configuration.

When you add a server, if it is the first server you add to a system's iSNS service configuration, it is designated as the primary server. If a server exists in the system's iSNS service configuration, any subsequent server you add is designated as a backup.

Note: The primary server is the server the iSNS service actively communicates with.

SYNTAX

isns -addserver *IPAddr* [**-o**]

OPTIONS

IPAddr

The IP address of the iSNS server you want to add.

Note: You must identify the iSNS server by the server's IP address. Specify the IP address in the form b.c.d.e where b, c, d and e range from 0 through 255, for example, 111.222.33.44.

-o

Executes the command without prompting for confirmation.

EXAMPLE

The following example adds the specified iSNS server, to the system's iSNS service configuration:

```
naviseccli -address ss1_spa isns -addserver 111.222.33.44
Adding an iSNS server with the following IP address: 111.222.33.44.
Do you really want to perform this action (y/n)? y
```

OUTPUT

None if the command succeeds; status or error information if it fails.

isns -deleteserver

Deletes an iSNS server from a system's iSNS service configuration

PREREQUISITES

You must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **naviseccli isns** command with the **-deleteserver** function, deletes an iSNS server from a system's iSNS service configuration.

Note: If the IP address of the server you want to delete is not configured, you will receive an error message.

If you delete a primary server, the next server listed in the system's iSNS service configuration becomes the primary.

Note: The primary server is the server the iSNS service actively communicates with.

SYNTAX

isns -deleteserver *IPAddr* [**-o**]

OPTIONS

IPAddr

The IP address of the iSNS server you want to delete.

Note: You must identify the iSNS server by the server's IP address. Specify the IP address in the form b.c.d.e where b, c, d and e range from 0 through 255, for example, 111.222.33.44.

-o

Executes the command without prompting for confirmation.

EXAMPLE

The following example deletes the specified iSNS server from the system's iSNS configuration:

```
naviseccli -address ss1_spa isns -deleteserver 111.222.33.44
Deleting an iSNS server with the following IP address:
111.222.33.44.
Do you really want to perform this action (y/n)? y
```

OUTPUT

None if the command succeeds; status or error information if it fails.

isns -listserver

Displays all iSNS servers that are configured in the system's iSNS service

PREREQUISITES

You must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **naviseccli isns** command with the **-listserver** function, lists all servers that are configured in a system's iSNS service.

If multiple servers are configured in the system's iSNS service, the **-listserver** operation will list multiple IP addresses and server types. You can have only one primary server; therefore you will only have one server designated as the primary. All other servers are designated as backup servers.

Note: The primary server is the server the iSNS service actively communicates with.

SYNTAX

```
isns -listserver
```

EXAMPLE

The following example lists the primary and backup iSNS servers for the system:

```
naviseccli -address ss1_spa isns -listserver
```

OUTPUT

```
IP Address: 111.222.33.44
Server Type: Backup
IP Address: 111.222.33.45
Server Type: Primary
```

IP Address is the IP address of the iSNS server. Server Type specifies whether the server is set as the primary or backup server.

isns -setprimary

Sets a configured iSNS server as the primary server for a system's iSNS service configuration

PREREQUISITES

You must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **naviseccli isns** command with the **-setprimary** function, establishes a configured iSNS server as the primary server in a system's iSNS service configuration. The primary server is the server the iSNS service actively communicates with. You can have only one primary server.

Note: If the IP address of the server you specify to be the primary server is not configured, you will receive an error message.

Use this command when you want to change the primary server in a system's iSNS service configuration. You can also use this command to re-establish a primary server after a failover. When a failure occurs that takes the existing primary server out of service, the iSNS service automatically establishes a backup server as the new primary server. You can use the **isns -setprimary** command to restore the original primary server as the primary server.

Note: If you have more than one backup server, the first backup server listed becomes the new primary server (see **isns -listserver**).

SYNTAX

isns -setprimary *IPAddr* [**-o**]

OPTIONS

IPAddr

The IP address of the iSNS server you want to designate as the primary server.

Note: You must identify the iSNS server by the server's IP address. Specify the IP address in the form b.c.d.e where b, c, d and e range from 0 through 255, for example, 111.222.33.44.

-o

Executes the command without prompting for confirmation.

EXAMPLE

The following example establishes the specified iSNS server as the primary server:

```
naviseccli -address ss1_spa isns -setprimary 111.222.33.44
The listed IP Address will become the Primary iSNS
server: 111.222.33.44.
Do you really want to perform this action (y/n)? y
```

OUTPUT

None if the command succeeds; status or error information if it fails.

LUN Migration commands

This section explains the Navisphere and Navisphere Express CLI commands that manage LUN migration.

LUN migration lets you improve the performance of a LUN by migrating the data from the source LUN to a destination LUN that has more desirable performance characteristics.

Note: This feature is supported only on AX4-5 series and CX series systems. It is not supported on the AX series systems.

migrate -start

Starts a LUN migration session

PREREQUISITES

You must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **naviseccli migrate** command with the **-start** switch starts a LUN migration session.

Note:

If the maximum number of migrations already exists on the subsystem, the new session is still created, but its state is **queued**.

For raw device mapping volumes (RDMs), if you are running VMware ESX Server and you are using the migration feature to copy LUNs to larger LUNs only, after you complete the migration you must rescan the bus at the ESX Server level. You can also rescan at the virtual machine level (optional). You then must expand the file system at the virtual machine level. ESX Server and the virtual machine will now recognize the completed migration.

For configuration specifications, go to the E-Lab Interoperability Navigator on EMC Powerlink.

There are two distinct versions of this command, one for Unisphere and one for Navisphere Express. When using this command with Navisphere Express, the syntax is simpler and does not require binding the destination LUN first. The process is different with Unisphere and requires you to bind the destination LUN before running the command.

SYNTAX

migrate -start -source *LUN ID|WWN* **-dest** *LUN ID|WWN* [**-rate low|medium|high|asap|***value*]

naviseccli migrate -start -source *LUN ID|WWN* **-rg** *ID* [**-o**]

OPTIONS

-source *LUN ID|WWN*

Specifies the source LUN for the migration. You can specify the LUN ID or World Wide Name (WWN).

-dest *LUN ID*|*WWN*

Specifies the destination LUN of the migration. You can specify the LUN ID or World Wide Name.

Note: The destination LUN must be the same size or larger than the source LUN.

-rate **low**|**medium**|**high**|**asap**|*value*

Specifies the LUN migration rate. Valid rates are **low** or **0**, **medium** or **1**, **high** or **2**, and **asap** or **3**.

Note: Do not use the **asap** migration rate when the system is in production, as the normal host I/O may be interrupted. Use **asap** only when the system is offline (free of any host-level I/O).

-source *LUN ID*|*WWN*

Specifies the source LUN for the migration. You can specify the LUN ID or World Wide Name (WWN).

-rg *ID*

Specifies the RAID group ID for the destination LUN to be created.

-o

Executes the command without prompting for confirmation.

EXAMPLE # 1

This command starts a LUN migration session where the source LUN's ID is 6, the destination LUN's ID is 7, and the LUN migration rate is low.

```
naviseccli migrate -start -source 6 -dest 7 -rate low
```

EXAMPLE # 2

This command starts a LUN migration session where the source LUN's ID is 1, and the RAID group ID for the destination LUN is 2.

```
naviseccli migrate -start -source 1 -rg 2 -o
```

OUTPUT

None if the command succeeds; status or error information if it fails.

migrate -cancel

Cancels a LUN migration session

PREREQUISITES

You must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **naviseccli migrate** command with the **-cancel** switch cancels an in-process LUN migration. The destination LUN is deleted when canceling occurs. Canceling the migration does not cause any data loss. The original LUN remains unchanged.

For AX4-5 series systems, the **migrate** command with the **-cancel** switch is supported only for halted or faulted migrations.

Note: You can cancel only one migration at a time.

SYNTAX

migrate -cancel -source LUN ID|WWN [**-o**]

OPTIONS

-source *LUN ID|WWN*

Specifies the source LUN for migration as the LUN ID or World Wide Name (WWN).

-o

Overrides; does not prompt for confirmation.

EXAMPLE

This command cancels a LUN migration session whose source LUN's ID is 6.

```
naviseccli migrate -cancel -source 6
```

OUTPUT

None if the command succeeds; status or error information if it fails.

migrate -modify

Modifies a LUN migration session

PREREQUISITES

You must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **naviseccli migrate** command with the **-modify** switch modifies a LUN migration session according to the parameters you specify.

SYNTAX

migrate -modify -source *LUN ID|WWN* [**-rate low|medium|high|asap|***value*] [**-o**]

OPTIONS

-source *LUN ID|WWN*

Specifies the source LUN of the migration you want to modify. You can specify the LUN ID or World Wide Name (WWN).

-rate low|medium|high|asap|*value*

Specifies the LUN migration rate. Valid rates are low or 0, medium or 1, high or 2, and asap or 3.

Note: Do not use the **asap** migration rate when the system is in production, as the normal host I/O may be interrupted.

Use **asap** only when the system is offline (free of any host-level I/O).

-o

Overrides; does not prompt for confirmation.

EXAMPLE

This command modifies the LUN migration rate to medium.

```
naviseccli migrate -modify -source 6 -rate medium
```

OUTPUT

None if the command succeeds; status or error information if it fails.

migrate -list

Lists LUN migration sessions and their properties

PREREQUISITES

You must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **naviseccli migrate** command with the **-list** switch lists the existing LUN migration sessions and their properties.

SYNTAX

```
migrate -list [-source LUN ID|WWN]
[-destination]
[-rate]
[-state]
[-percentcomplete]
[-timeremaining]
```

OPTIONS

-source *LUN ID|WWN*

Specifies the source LUN of the migration. You can specify the LUN ID or World Wide Name (WWN). If you specify the **-source** switch with a LUN, the command lists properties for only that migration. If you do not specify a source LUN, the output lists the properties for all migrations.

-destination

Displays the destination LUN.

-rate

Displays the LUN migration rate as **low**, **medium**, **high**, or **asap**.

-state

Displays the migration state as queued, migrating, migrated, transitioning, or faulted.

-percentcomplete

Displays the percentage of the migration that has completed.

-timeremaining

Displays the estimated time remaining for the migration to complete. For the first poll cycle after the migration is started, the **Time Remaining** field is displayed as ? (question mark).

EXAMPLE

This command lists the migration sessions and their properties.

```
naviseccli migrate -list
```

OUTPUT

```
Source LU Name: LUN 6
Source LU ID: 6
Dest LU Name: LUN 7
Dest LU ID: 7
Migration Rate: LOW
Current State: MIGRATING
Percent Complete: 12
Time Remaining: 1 minute(s)
```

Domain and Security commands

This section provides a brief overview of the domain and security features, and includes a list of commands you can use to manage system domains and user access to systems.

About domains and user accounts

A domain is a group of one or more systems with Storage Management Server software whose SPs are connected to a network and which have been assigned to the domain by Navisphere CLI or Unisphere. Each domain has a master node (master system) that maintains the master copy of the domain data — the systems and global user accounts that make up the domain.

Setting up a domain allows a group of systems to be monitored and managed using a single login. Even if you plan to use a system by itself (manage it separately), we suggest that you create a domain for that system.

Note: When you setup a user account, you assign a scope of either global, local, or LDAP. Global user accounts apply to all systems within a domain. Local user accounts apply to a specific system. LDAP uses an external server to authenticate accounts for an entire domain.

Navisphere CLI versions 6.24 and later support lightweight directory access protocol (LDAP). This requires an active and operational LDAP environment to which you can connect Unisphere security for the purpose of sharing user accounts and authenticating usernames and passwords.

Administrators can manage accounts in a centralized directory accessible to multiple applications. Users can use their LDAP credentials to log in and perform Unisphere and CLI operations.

Note: In order to issue domain CLI commands, you must have global administrator privileges.

A user (that is, someone who needs to view or manage system operations) can have one of these roles:

- Administrator
- Security Administrator
- Manager
- Monitor
- Replication
- Local replication
- Replication/recovery

Note: To issue security CLI commands for user account setup, modification, or removal you must have administrator privileges. Global administrators can manage both global and local user accounts. Local administrators can manage only local user accounts. Table 4 provides an explanation of operations that can be performed by role and scope.

You can assign a user a role globally (the user has the role across all systems in the domain) or locally (the user has the role on a specific system only). Each global username must be unique in the domain; each local username must be unique within the local management server.

Note: Usernames and passwords can be 1 to 32 characters, including letters (case sensitive), numbers, underscores, non-numeric, non-alpha characters, spaces, and must start with a letter.

Table 7 on page 464 defines the operations a user can perform by role and scope.

Table 7. Operations that users with different roles can perform

User role	Can view	Can add, modify, or delete
Administrator	All domain and system settings, and global and local accounts	All domain and system settings, and global and local accounts (cannot delete the last global administrator account)
Currently, the following security administrator roles are supported only on CX and CX3 series systems running FLARE version 02.26.xxx.yyy.zzz or higher.		
Security Administrator	All security-related features, global and local accounts	All security features. Cannot see or manage system features
Manager	All system settings in domain	All system settings in domain
Monitor	All system settings in domain	Nothing
Local Replication	All system settings in domain	Some operations of MirrorView, SAN Copy, and SnapView (see Table 8 on page 464)
Replication	All system settings in domain	Some operations of MirrorView, SAN Copy, and SnapView (see Table 8 on page 464)
Replication and recovery	All system settings in domain	Some operations of MirrorView, SAN Copy, and SnapView (see Table 8 on page 464)

Table 8. Actions permission

Command	Local replication	Replication	Replication/Recovery
SnapView			
Start a (consistent) snap session	Yes	Yes	Yes
Stop a (consistent) snap session	Yes	Yes	Yes
Activate a session to a snapshot LUN	Yes	Yes	Yes

Table 8. Actions permission *(continued)*

Command	Local replication	Replication	Replication/Recovery
Deactivate a session from a snapshot LUN	Yes	Yes	Yes
Synchronize a clone	Yes	Yes	Yes
Fracture a clone	Yes	Yes	Yes
Rollback a snap session	No	No	Yes
Reverse synchronize a clone	No	No	Yes
MirrorView			
Synchronize a mirror/consistency group	No	Yes	Yes
Fracture a mirror/consistency group	No	No	Yes
Control the update parameters of an asynchronous mirror	No	Yes	Yes
Modify the update frequency of an asynchronous mirror	No	Yes	Yes
Throttle a mirror/consistency group	No	Yes	Yes
Promote a synchronous or asynchronous secondary mirror/consistency group	No	No	Yes
SAN Copy			
Start a session	No	Yes	Yes
Stop a session	No	Yes	Yes
Pause a session	No	Yes	Yes
Resume a session	No	Yes	Yes
Mark a session	No	Yes	Yes
Unmark a session	No	Yes	Yes
Verify a session	No	Yes	Yes
Throttle a session	No	Yes	Yes

About LDAP and Active Directory

Navisphere supports the Lightweight Directory Access Protocol (LDAP). Since Microsoft Active Directory is based on LDAP, Active Directory (AD) is supported as well. LDAP uses an active and operational LDAP environment, which allows systems to share LDAP user accounts and username/password authentication.

The administrator and security administrator can then manage the external servers. Users can use their LDAP credentials to log in and perform CLI operations. You must map groups and/or users from the LDAP-compliant directory service to their roles (Administrator and Monitor) using the **`security -ldap`** commands.

Use these commands to specify the LDAP or AD server you intend to use in your domain, and to map roles to users and user groups in the LDAP server directory.

This feature also supports advanced functions, such as specifying attributes for which user IDs and user/group common names are appended in the LDAP/AD server, defining user and group object classes, and mapping roles to additional servers.

Consult with your site LDAP administrator to determine the correct parameters.

Table 9 on page 467 provides the list of **`security -ldap`** commands used to configure the LDAP settings.

Domain and security commands overview

The **naviseccli** commands in this section include the domain and security commands. The following table identifies the commands.

Note: The domain commands, **-list**, **-setmaster**, and **-remove**, running on AX4-5 series Navisphere Express are supported with FLARE version 02.23.050.5.7.xx or later.

The respective security commands, **-adduser**, **-changeuserinfo**, **-rmuser**, and **-list** support adding, changing, removing a global administrator user account information and listing all the users on an AX4-5 series Navisphere Express system with FLARE version 02.23.050.5.7.xx or later.

Table 9. naviseccli domain and security commands

Command	Description
Domain commands	
domain -add	Adds one or more systems to a domain.
domain -list	Displays all systems in a domain.
domain -remove	Removes a system from a domain.
domain -setmaster	Sets a system as the master system in a domain.
ntp -list	Lists the NTP configuration settings in a domain.
ntp -set	Modifies the NTP configuration in a domain.
Security commands	
security -adduser	Creates a user account.
security -changeuserinfo	Changes the password and/or role of a user account.
security -list	Displays user accounts.
security -listrole	Lists the user's security role.
security -rmuser	Deletes a user account.
Security LDAP commands	
security -ldap -addServer	Creates a new external server.
security -ldap -modifyserver	Modifies the external server login configuration.

Table 9. naviseccli domain and security commands *(continued)*

Command	Description
security -ldap -removeserver	Removes a server.
security -ldap -listserver	Lists the LDAP external server information.
security -ldap -addrolemapping	Creates a new role mapping.
security -ldap -modifyrolemapping	Modifies the role mapping.
security -ldap -removerolemapping	Removes the role mapping entity.
security -ldap -listrolemapping	Lists the role mapping entity.
security -ldap -synchronize	Synchronizes the accounts.
security -ldap -bypasscert	Sets or gets the bypass certificate verification.
Security Certificate commands	
security -certificate -add	Imports the certificate.
security -certificate -remove	Removes the specified certificate.
security -certificate -list	Lists all certificates.
Security FIPS commands	
security -fipsmode -set	Sets FIPS mode.
security -fipsmode -get	Retrieves FIPS mode.

domain -add

Adds system to a domain

PREREQUISITES

You must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **naviseccli domain** command with the **-add** function, adds the system you specify to the system domain. You can add only one system to the domain one time. When you add a system to the domain, you specify the system's IP address.

See domain -setmaster if you need to establish a domain. You then can add system to the domain using **domain -add**.

The **-olduser**, **-oldpassword**, and **-oldscope** are optional switches. These switches must be provided all together or none of them must be provided. If none of them are provided, the user account, **sysadmin** with global scope is used as a default user to operate on the system.

Only one IP address is supported. If multiple IP addresses are provided, displays the error message,

```
Invalid Command. Too many parameters Please also make sure only ONE
ip address is provided.
```

If the user uses **domain -add** to add File or Unified systems into a domain without System account, the command fails and displays the error message,

```
Domain add operation failed. The local domain does not have a system
account, which is required when adding a file or unified system into
a domain. Create a system administrator account in order to continue
with adding this system into the domain.
```

Any File or Unified system is allowed to be added into another domain, only if it is in a domain. Otherwise, displays the error message,

```
Domain add operation failed.Security is not initialized. Security must
be initialized before any domain operations can be performed in this
system. Create a global administrator to initialize security.
10.244.212.164.
```

Note: The **domain -add** command is supported for AX4-5 series Navisphere Express only with FLARE version 02.23.050.5.7.xx or later and not with any prior FLARE versions.

SYNTAX

domain -add *IPAddr* [[**-olduser** *olduser*][**-oldpassword** *oldpassword*][**-oldscope** *oldscope*]][**-o**]

OPTIONS

IPAddr

The IP address of the system you want to add.

Note: You must identify the system by the system's IP address. Specify the IP address in the form b.c.d.e where b, c, d and e range from 0 through 255, for example, 111.222.33.44.

-olduser *olduser*

Specifies a valid username in the old domain.

-oldpassword *oldpassword*

Specifies the matching password for the **-olduser**.

-oldscope *oldscope*

Specifies the valid scope for the **-olduser**.

-o

Executes the command without prompting for confirmation.

EXAMPLE # 1

The following example adds the specified systems, to the system domain:

```
naviseccli -address ss1_spa domain -add 111.222.33.44 111.222.33.45

WARNING: You are about to add following node(s) to
the domain.
111.222.33.44
111.222.33.45

Proceed? (y/n) y
```

EXAMPLE # 2

```
naviseccli -h 10.14.22.33 -user a -password a -scope global domain -add
10.14.33.44 -olduser b -oldpassword b -scope global
```

EXAMPLE # 3

If any of the switches, **-olduser**, **-oldpassword**, or **-oldscope** are missing, the following error messages are displayed accordingly:

```
C:\>naviseccli -h 10.244.212.164 domain -add 10.244.211.204 -oldscope global
      Invalid command line parameters.  Please provide the user name for
      the remote sy
      stem: -olduser


C:\>naviseccli -h 10.244.212.164 domain -add 10.244.211.204 -olduser global
      Invalid command line parameters.  Please provide the scope for the
      remote system
      : -oldscope


C:\>naviseccli -h 10.244.212.164 domain -add 10.244.211.204 -oldpassword
global
      Invalid command line parameters.  Please provide the user name for
      the remote sy
      stem: -olduser
```

OUTPUT

None if the command succeeds; status or error information if it fails.

domain -list

Displays all systems in a domain

PREREQUISITES

You must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **naviseccli domain** command with the **-list** function, lists the IP address, name, port and secure port information for all systems in a system domain. If you want to view only information about the master system in the domain, you can use the optional **-master** switch.

Note: You can have only one master system in a domain (see domain -setmaster on page 476).

The **domain -list** command is supported for AX4-5 series Navisphere Express only with FLARE version 02.23.050.5.7.xx or later and not with any prior FLARE versions.

SYNTAX

```
domain -list [-master]
```

OPTIONS

-master

Displays only information about the master system in the domain.

EXAMPLE

The following example lists the systems in the system domain:

```
naviseccli -address 111.222.33.44 domain -list
```

OUTPUT

```
Node:            APM00011111111
IP Address:      111.222.33.55
(Master)
Name:            CX300I_33_55
Port:            80
Secure Port:     443
IP Address:      111.222.33.44
Name:            CX300I_33_44
Port:            80
Secure Port:     443
```

domain -remove

Removes a system from a domain

PREREQUISITES

You must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **naviseccli domain** command with the **-remove** function removes the system you specify from a system domain. When you remove a system from a domain, you specify the system's IP address.

If you want to move a system to a different domain, use **domain -remove** to remove the system from the current domain, then **domain -add** to add the system to the other domain.

Note: If you remove the master system from the domain, you destroy the domain. The CLI warns you before you can complete the operation. If the system you want to move is the master system in the domain, and you want to retain the domain, then you should change the master system to another system in the domain before moving the old master (see domain -setmaster on page 476).

SYNTAX

domain -remove *IPAddr*[**-password** *password*][**-o**]

OPTIONS

IPAddr

The IP address of the system you want to remove.

Note: You must identify the system by the system's IP address. Specify the IP address in the form b.c.d.e where b, c, d and e range from 0 through 255, for example, 111.222.33.44.

-password *password*

Overrides the default password for the global administrator.

Important: You must override the default password. If you don't override it, the system accepts the default password that may pose a high security risk.

-o

Executes the command without prompting for confirmation.

EXAMPLE

The following example removes the specified system, from the system domain:

```
naviseccli -address ss1_spa domain -remove 111.222.33.44

WARNING: You are about to remove the following node
from the domain: 111.222.33.44

Proceed? (y/n) y
```

OUTPUT

None if the command succeeds; status or error information if it fails.

domain -setmaster

Sets a system as the master system in a domain

PREREQUISITES

You must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **naviseccli domain** command with the **-setmaster** function, establishes the system you specify as the master system in a domain. The master system holds the master copy of all global account information in the domain. This information is copied to all member systems in the domain. You can have only one master system in a domain. You can use **domain -setmaster** to establish a domain or to change the master system in an existing domain.

Note: An AX series system can act as the domain master in a single-system domain that contains only an AX series system. An AX series system cannot act as a domain master in a multiple-system domain. You must establish a CX3 series, CX series, or off-array host to act as the domain master.

If you are using **domain -setmaster** to set up a domain, specify the IP address of a new or existing system that is not part of an existing domain. This system becomes the master and initializes the domain. You can then use the **domain -add** command to add more systems to the domain.

When you use **domain -setmaster** to change the master system in an existing domain, the existing master system is automatically demoted, and the system you specify becomes the new master system.

Note: The **domain -setmaster** command is supported for AX4-5 series Navisphere Express only with FLARE version 02.23.050.5.7.xx or later and not with any prior FLARE versions.

SYNTAX

domain -setmaster *IPAddr*[**-o**]

OPTIONS

IPAddr

The IP address of the system you want to set as master.

Note: You must identify the system by the system's IP address. Specify the IP address in the form b.c.d.e where b, c, d and e range from 0 through 255, for example, 111.222.33.44.

-o

Executes the command without prompting for confirmation.

EXAMPLE

The following example sets the specified system as the master system in a domain:

```
naviseccli -address ss1_spa domain -setmaster 111.222.33.44

WARNING: You are about to set the following node as
the master of the domain: 111.222.33.44

Proceed? (y/n) y
```

OUTPUT

None if the command succeeds; status or error information if it fails.

ntp -list

Lists the NTP configuration settings in effect in a domain

PREREQUISITES

You must have a user account on the system on which you want to execute the command.

Only a security administrator or an administrator has the access rights.

You will receive an error message if access is denied or an invalid parameter is set.

DESCRIPTION

The **naviseccli ntp** command with the **-list** function, lists the Network Time Protocol (NTP) configuration settings in effect in a domain.

SYNTAX

ntp -list |-control|-servers|-all

OPTIONS

-control

Displays start/stop and interval information.

-servers

Displays configured server addresses and any associated authentication information.

-all

Displays all information.

EXAMPLE

The following example lists all the information:

```
naviseccli -user a -password a -scope 0 -address 10.5.1.207 ntp -list
-all
```

OUTPUT

```
Output: -all
start: YES
interval: 720 minutes
address: 10.5.1.207 128.221.142.13
serverkey: 0
keyvalue: ""

XML Output:

-list -all

<?xml version="1.0" encoding="utf-8" ?>
<CIM CIMVERSION="2.0" DTDVERSION="2.0"><MESSAGE ID
="877"
PROTOCOLVERSION="1.0"><SIMPLERSP><METHODRESPONSE
NAME="ExecuteClientRequest"><RETURNVALUE
TYPE="Navi_Error">
<VALUE.NAMEDINSTANCE>
<INSTANCENAME CLASSNAME="Navi_Error">
</INSTANCENAME>
<INSTANCE CLASSNAME="Navi_Error">
<PROPERTY NAME="errorCode"
TYPE="uint32"><VALUE>0</VALUE>
</PROPERTY>
<PROPERTY NAME="success"
TYPE="boolean"><VALUE>true</VALUE>
</PROPERTY>
<PROPERTY NAME="where"
TYPE="string"><VALUE>NTPProvider</VALUE>
</PROPERTY>
<PROPERTY NAME="why" TYPE="string"><VALUE>Operation
successfully completed. </VALUE>
</PROPERTY>
</INSTANCE>
</VALUE.NAMEDINSTANCE>
</RETURNVALUE><PARAMVALUE NAME="start:"
TYPE="string"><VALUE>yes</VALUE>
</PARAMVALUE>
<PARAMVALUE NAME="interval:"
TYPE="string"><VALUE>30</VALUE>
</PARAMVALUE>
<PARAMVALUE NAME="address:"
TYPE="string"><VALUE>10.5.4.211 128.222.132.13</VALUE>
</PARAMVALUE>
<PARAMVALUE NAME="serverkey:" TYPE="string"><VALUE>1
0</VALUE>
</PARAMVALUE>
<PARAMVALUE NAME="keyvalue:"
TYPE="string"><VALUE>&amp;quot;1234567812345678&amp;quot;
&amp;quot;&amp;quot;</VALUE>
</PARAMVALUE>
</METHODRESPONSE></SIMPLERSP></MESSAGE></CIM>
```

ntp -set

Modifies the NTP configuration in a domain

PREREQUISITES

You must have a user account on the system on which you want to execute the command.

Only a security administrator or an administrator has access rights.

You will receive an error message if the access is denied or an invalid parameter is set.

DESCRIPTION

The **naviseccli ntp** command with the **-set** function modifies the NTP configuration in a domain.

SYNTAX

ntp -set [**-start yes**|**no**] [**-interval** *n* **-servers** *addr1* [*addr2...*] **-serverkey** *sk1* [*sk2....*] **-keyvalue** *kval1* [*kval2...*]]

OPTIONS

-start yes|**no**

Yes starts NTP; no stops it. To start NTP, servers must have been defined and have been displayed previously in a list command or while running this command.

-interval *n*

Specifies the synchronization interval in minutes ranging from 30 to 43200 (30 days).

-servers *addr1* [*addr2...*]

Specifies the list of IPv4 NTP server addresses. At least one address must be specified.

-serverkey *sk1* [*sk2...*]

Specifies the list of the integer values (1-65534 inclusive). This option is required if server authentication is desired. An ordered list is in the same order as -servers. A value of 0 indicates no key will be used. In that case use a keyvalue of "". If serverkey is used, every address entry must have a corresponding server key.

-keyvalue *kval1* **<** *kval2...***>**

Specifies the list of key values. This option is required if serverkey is specified. If server authentication is not desired, keyvalue is not required. Enclose key values in quotation marks. An empty value is simply a pair of quotation marks (for serverkey value = 0). An ordered list is in the same order as serverkey above. Every server key must have a key value. Valid key values are printable ASCII characters excluding the space character and the # character. If specified, the length of each key must be between 1 and 16 characters (empty value is described above).

EXAMPLE # 1

Specifies all items for ss1_spa including server authentication.

```
naviseccli -address ss1_spa -set -start yes -interval
45 -servers
10.5.1.207 128.222.132.13 -serverkey 1 5 -keyvalue
"1234567812345678" "abcdefghabcdefgh"
```

EXAMPLE # 2

Specifies all items for ss1_spa including server authentication but the key for addr2 is not specified.

```
naviseccli -address ss1_spa -set -start yes -interval
45 -servers
10.5.1.207 128.222.132.13 -serverkey 5 0 -keyvalue
"1234567812345678" ""
```

EXAMPLE # 3

Specifies items for ss1_spa choosing not to use server authentication.

```
naviseccli -address ss1_spa -set -start yes -interval
45 -servers
10.5.1.207
```

EXAMPLE # 4

Stops (disables) NTP operations for ss1_spa.

Note: Does not affect synchronization interval or servers settings.

```
naviseccli -address ss1_spa -set -start no
```

EXAMPLE # 5

Specifies the interval and server information for ss1_spa.

Note: Does not affect start/stop settings.

```
naviseccli -address ss1_spa -set -interval 45 -servers
10.5.1.207 128.222.132.13 -serverkey 5 0 -keyvalue
 "1234567812345678" ""
```

OUTPUT

Varies depending on the switch you use.

security -adduser

Creates a user account

PREREQUISITES

You must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **naviseccli security** command with the **-adduser** function, adds a user account to the system you specify. If you create a global account, it replicates to all systems in the domain. When you add a user account, you specify the username, password, scope and role.

System account is a special global administrator account which is used to issue CLI command from File to Block. System account needs to be created immediately after the upgrade to R31

The **-type** option differentiates the user account and system account. If **-type** is not specified, the system creates the account of **User** type, by default.

Note: When you create the initial global administrator user account, you do not need to provide a username and password at login.

The **security -adduser** command for adding a global administrator user account on AX4-5 series Navisphere Express is supported only with FLARE version 02.23.050.5.7.xx and not with any prior FLARE versions.

SYNTAX

```
security -adduser -user username -password password -scope global|local
-role administrator|manager|monitor [-type
user|system]
[-o]
```

OPTIONS

-user *username*

Specifies the username you want to create for the user account.

-password *password*

Specifies the password you want to create for the user account.

-scope global|local|LDAP

Specifies the scope (global, local, or LDAP) you want to apply to the user account.

-role administrator|manager|monitor

Specifies the role, administrator, manager, or monitor, you want to apply to the user account.

-typeuser|system

If you specify user, a user account is created. If you specify system, a system account is created. You cannot create more than one system account in a domain and a non-global or a non-administrator system account.

-o

Executes the command without prompting for confirmation.

EXAMPLE

The following example creates the initial global administrator account on the system. You are then prompted to create a domain for the system you specify:

```
naviseccli -address ss1_spa security -adduser -user a -password
b -
scope global -role administrator

Global security is not initialized. It is highly recommended
that you initialize global security.

Do you still want to continue? y

WARNING: You are about to add user:  a

Proceed?(y/n) y

This system is not in a domain. It is highly
recommended you create a new domain for this system.
```

OUTPUT

None if the command succeeds; status or error information if it fails.

security -changeuserinfo

Changes the password and/or role of a user account

PREREQUISITES

You must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **naviseccli security** command with the **-changeuserinfo** function, modifies the password and/or role of a user account. When you modify a user account, you specify the username and scope, then designate a new password and/or role.

Note: You can change the password in a user account without providing the user's current password.

The **security -changeuserinfo** command for changing global administrator user account information on AX4-5 series Navisphere Express systems is supported only with FLARE version 02.23.050.5.7xx and not with any prior FLARE versions.

Note: If a user attempts to change the role or the scope of an account with the System designation, the command fails.

SYNTAX

security -changeuserinfo -user *username* **-scope global|local** [**-newpassword** *password*] [**-newrole administrator|manager|monitor**] [**-o**]

OPTIONS

user *username*

Specifies the username of the user account you want to modify.

-scope global|local

Specifies the scope, global or local, of the user account you want to modify. A global account has access to all systems in a domain.

-newpassword *password*

Specifies the new password you want to create for the user account.

-newrole administrator|manager|monitor

Specifies the new role, administrator, manager, or monitor, you want to apply to the user account.

-o

Executes the command without prompting for confirmation.

EXAMPLE

The following example modifies the role of an existing user account:

```
naviseccli -address ss1_spa security -changeuserinfo -user
b -scope
local -newrole manager

WARNING: You are about to change user:  b (local)

Proceed?(y/n) y
```

OUTPUT

None if the command succeeds; status or error information if it fails.

security -list

Displays user accounts

PREREQUISITES

You must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **naviseccli security** command with the **-list** function, lists the username, scope, role of user accounts, and type of account.

Note: The **security -list** command is supported on all Unisphere systems.

The **security -list** command on AX4-5 series Navisphere Express systems is supported only with FLARE version 02.23.050.5.7xx and not with any prior FLARE versions.

SYNTAX

security -list [**-user** *username*] [**-scope global|local**] [**-role administrator|manager|monitor**][**-type**]

OPTIONS

-user *username*

Identifies a specific username for which you want to display information.

-scope global|local

Identifies users with a specific scope for which you want to display information.

-role administrator|manager|monitor

Identifies users with a specific role for which you want to display information.

-type

Displays the type of account, either a user account or a system account.

EXAMPLE

The following example lists users with the specified scope and role:

```
naviseccli -address ss1_spa security -list -role
monitor -scope
global
```

OUTPUT

```
Username:  c
Role:      monitor
Scope:     global
```

security -listrole

Lists the user's security role

PREREQUISITES

You must have a user account on the system on which you want to execute the command. If no user account matches the query, an access denied error will be displayed.

DESCRIPTION

The **naviseccli security** command with the **-listrole** function, lists the user's security role.

SYNTAX

```
security -listrole
```

EXAMPLE

The following example lists the user's security role:

```
naviseccli -h 10.14.83.44 security -listrole
```

OUTPUT

```
Role:  Administrator
```

security -rmuser

Deletes a user account

PREREQUISITES

You must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **naviseccli security** command with the **-rmuser** function, removes the user account you specify. When you remove a user account, you specify the username and scope.

Note: You must specify a scope for the user you want to remove, since you can establish two user accounts with the same username and varying scopes, one global and one local.

The **security -rmuser** command for removing a global administrator user account on AX4-5 series Navisphere Express systems is supported only with FLARE version 02.23.050.5.7xx and not with any prior FLARE versions.

SYNTAX

security -rmuser -user *username* **-scope global|local** [**-o**]

OPTIONS

-user *username*

Identifies the username of the account you want to remove.

-scope global|local

Specifies the scope, global or local, of the account you want to remove.

-o

Executes the command without prompting for confirmation.

EXAMPLE

The following example removes the specified user account:

```
naviseccli -address ss1_spa security -rmuser -user b -scope
local

WARNING: You are about to remove user:  b (local)

Proceed?(y/n) y
```

OUTPUT

None if the command succeeds; status or error information if it fails.

security -ldap -addserver

Creates a new external server

PREREQUISITES

You must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **naviseccli security -ldap** command with the **-addserver** subcommand creates a new external server login configuration. Only a Unisphere security administrator or administrator can connect your system to an LDAP or Active Directory (AD) service. After defining the server connection settings, and mapping the user's roles, users can log in to the system with their LDAP username/password. Only two service connections can be configured at a time.

System security must be initialized and a domain master must be selected before configuring LDAP connection settings. Consult with the LDAP site administrator to determine the correct parameters.

SYNTAX

```
security -ldap -addserver IPaddress -portnumber portnumber -servertype
LDAP|AD -protocol LDAP|LDAPS -binddn binddn
-bindpassword password -usersearchpath usersearchpath
[-groupsearchpath groupsearchpath] [-useridattribute attribute]
[-usernameattribute nameattribute] [-groupnameattribute
groupattribute] [-groupmemberattribute memberattribute]
[-userobjectclass objectclass] [-groupobjectclass groupclass]] [-cert
pathToCertificatefile] [-o]
```

OPTIONS

IPaddress

Specifies the network IP address (IPv4) of the LDAP/AD server with the information required to authenticate users.

-portnumber *portnumber*

Specifies the port number that the server will open to allow external programs to access it. If the protocol is LDAP, the default port number is 389. If the protocol is LDAPS, the default port number is 636.

-servertype LDAP|AD

Specifies whether the server is a LDAP directory or AD server. The default is LDAP.

-protocol LDAP|LDAPS

Lets you specify either LDAPS or LDAP protocol.

-binddn *binddn*

Specifies the login name for the LDAP/AD server; it cannot exceed 512 characters. This field allows an LDAP-enabled application to access the targeted server and search for a user ID/password to validate. It should be in "cn=, ou=, dc=, dc=" format.

-bindpassword *password*

Credentials used to authenticate the bind DN. If you specify the length of other options such as -binddn, the length of bindpassword should also be specified here. The bindPassword cannot exceed 512 characters.

-usersearchpath *usersearchpath*

Sets the path within the LDAP user entry database where a search for the username/password begins. It cannot exceed 512 characters. It should be in "ou=, dc=, dc=" format.

-groupsearchpath *groupsearchpath*

Sets the path within the LDAP user-group entry database where a search for the group name/password begins. It cannot exceed 512 characters. It should be in "ou= , dc=, dc= " format. The option defaults to the User Search Path if you do not specify the path.

-useridattribute *useridattribute*

Specifies the attribute to which the user ID will be appended in the LDAP/AD servers. The directory hierarchy will be searched using this attribute/userid pair. The default for an LDAP directory is uid and the default for an AD is sAMAccountName. It cannot exceed 128 characters.

-usernameattribute *nameattribute*

Specifies the attribute to which the user's common name (cn) will be appended in the servers. The default is cn and it cannot exceed 128 characters.

-groupnameattribute *groupattribute*

Specifies the attribute to which the user group's common name will be appended in the servers. This is stored as an attribute of an entry within the Group Search Path of the directory. The default is cn and it cannot exceed 128 characters.

-groupmemberattribute *groupattribute*

Acts as a search filter for the different attribute types to identify the different groups of members. If you do not specify this field, then a search will be performed using only the Group Name Attribute parameter. The default value for an LDAP directory is uniqueMembers and the default for an AD is member. It cannot exceed 128 characters.

-userobjectclass *objectclass*

Defines the required and optional attributes so that the user entry can act as a search filter in a situation where a user has multiple entries in a server. If you do not specify this field, then a search will be performed using only the User ID Attribute parameter. It cannot exceed 128 characters.

-groupobjectclass *groupclass*

Defines the required and optional attributes so that the group entry can act as a search filter in a situation where a group has multiple entries in a server. If you do not specify this field, then a search will be performed using only the Group Name Attribute parameter. The default for an LDAP directory is groupOfUniqueNames and the default for an AD is group. It cannot exceed 128 characters.

-cert *pathToCertificatefile*

Specifies the full pathname of the trusted certificate file to be uploaded to the certificate store.

-o

Executes the command without prompting for confirmation.

EXAMPLE

```
naviseccli -h 10.32.123.229 -user a -password a -scope 0 security
-ldap -addserver 10.5.4.111 -portnumber 389 -servertype LDAP
-protocol LDAP -binddn cn=Manager,dc=ipv4,dc=com
-bindpassword ipv4int -usersearchpath ou=Users,dc=ipv4,dc=com
```

OUTPUT

None if the command succeeds; status or error information if it fails.

security -ldap -modifyserver

Modifies the external server login configuration

PREREQUISITES

You must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **naviseccli security -ldap** command with the **-modifyserver** subcommand modifies the settings that connect your system to an LDAP or AD service. Consult with the LDAP/AD site administrator to determine the correct parameters. Only the security administrator or administrator can execute this command.

SYNTAX

security -ldap -modifyserver IPaddress -bindpassword *password* [**-ldapserver** *IPaddress*] [**-portnumber** *portnumber*] [**-servertype** **LDAP**| **AD**] [**-protocol LDAP**| **LDAPS**] [**-binddn** *binddn*] [**-newbindpassword** *password*] [**-usersearchpath** *usersearchpath*] [**-groupsearchpath** *groupsearchpath*] [**-useridattribute** *useridattribute*] [**-usernameattribute** *usernameattribute*] [**-groupnameattribute** *groupnameattribute*] [**-groupmemberattribute** *groupmemberattribute*] [**-userobjectclass** *userobjectclass*] [**-groupobjectclass** *groupclass*] [**-o**]

OPTIONS

IPaddress

Specifies the network IP address (IPv4) of the LDAP/AD server with the information required to authenticate users.

-bindpassword *password*

Credentials used to authenticate the bind DN. If you specify the length of other options such as **-binddn**, the length of bindpassword should also be specified here. The bindpassword cannot exceed 512 characters.

-ldapserver *IPaddress*

Specifies the network IP address (IPv4) of the LDAP server.

-portnumber *portnumber*

Lets you specify the port number that the server will open to allow external programs to access it. If the protocol is LDAP, the default port number is 389. If the protocol is LDAPS, the default port number is 636.

-servertype LDAP|AD

Specifies whether the server is an LDAP directory or AD server. The default is LDAP.

-protocol LDAP|LDAPS

Lets you specify either LDAPS or LDAP protocol.

-binddn *binddn*

Specifies the login name for the LDAP/AD server; it cannot exceed 512 characters. This field allows an LDAP-enabled application to access the targeted server and search for a userid/password to validate. It should be in "cn=, ou=, dc=, dc=" format.

-newbindpassword *password*

Specifies the password that corresponds to the bind DN; and it cannot exceed 512 characters.

-usersearchpath *usersearchpath*

Sets the path within the LDAP user entry database where a search for the username/password begins. It cannot exceed 512 characters. It should be in "ou=, dc=, dc=" format.

-groupsearchpath *groupsearchpath*

Sets the path within the LDAP user-group entry database where a search for the group name/password begins. It cannot exceed 512 characters. It should be in "ou= , dc=, dc= " format . The option defaults to the User Search Path if you do not specify the path.

-useridattribute *useridattribute*

Specifies the attribute to which the user ID will be appended in the LDAP/AD servers. The directory database is searched using this attribute/userid pair. The default for an LDAP directory is uid and the default for an AD is sAMAccountName. It cannot exceed 128 characters.

-usernameattribute *usernameattribute*

Specifies the attribute to which the user's common name (cn) will be appended in the servers. The default is cn. It cannot exceed 128 characters.

-groupnameattribute *groupnameattribute*

Specifies the attribute to which the user group's common name will be appended in the servers. This is stored as an attribute of an entry within the Group Search Path of the directory. The default is cn. It cannot exceed 128 characters.

-groupmemberattribute *groupmemberattribute*

Acts as a search filter for the different attribute types to identify the different groups of members. If you do not specify this field, then a search will be performed using only the Group Name Attribute parameter. The default value for an LDAP directory is uniqueMembers and the default for an AD is member. It cannot exceed 128 characters.

-userobjectclass *userobjectclass*

Defines the required and optional attributes so that the user entry can act as a search filter in a situation where a user has multiple entries in a server. If you do not specify this field, then a search will be performed using only the User ID Attribute parameter. It cannot exceed 128 characters.

-groupobjectclass *groupclass*

Defines the required and optional attributes so that the group entry can act as a search filter in a situation where a group has multiple entries in a server. If you do not specify this field, then a search will be performed using only the Group Name Attribute parameter. The default for an LDAP directory is groupOfUniqueNames, and the default for an AD is group. It cannot exceed 128 characters.

-o

Executes the command without prompting for confirmation.

EXAMPLE

```
naviseccli -h 10.32.123.229 -user a -password a -scope 0 security
-ldap -modifyserver  10.5.4.250 -bindpassword crosstor -servertype
LDAP
```

OUTPUT

None if the command succeeds; status or error information if it fails.

security -ldap -removeserver

Removes a server

PREREQUISITES

You must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **naviseccli security -ldap** command with the **-removeserver** subcommand deletes an LDAP external server login configuration. It also destroys all role mapping information related to the specified server. Only the security administrator or administrator can execute the command.

SYNTAX

```
security -ldap -removeserver IPaddress [-o]
```

OPTIONS

IPaddress

Deletes the specified network IP address (IPv4) of the LDAP or the AD server.

-o

Executes the command without prompting for confirmation.

EXAMPLE

```
security -ldap -removeserver 10.5.4.250
```

OUTPUT

None if the command succeeds; status or error information if it fails.

security -ldap -listserver

Lists the LDAP external server information

PREREQUISITES

You must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **naviseccli security -ldap -listserver** command lists the existing service connections, that the IP address of the LDAP server identifies. You can use the optional switches to list a particular server. Only the security administrator or administrator can execute the command.

SYNTAX

```
security -ldap -listserver [-primaryserver|-alternateserver]
```

OPTIONS

-primaryserver

Displays the primary server information. The connection, which is set up first, is automatically designated as the primary and is contacted first to authenticate a user or user request.

-alternateserver

Displays the alternate server information. The only way to change the alternate server to primary is to delete the primary server.

EXAMPLE

```
Security -ldap -listserver

Primary Server Name: 10.5.4.111
Primary Server Port Number: 389
Primary Server Protocol: ldap
Primary Server ServerType:  AD
Primary Server BindDn:
cn=administrator,cn=users,dc=NavilabTEST,dc=us,dc=dg,dc=
com
Primary Server UserSearchPath:
dc=NavilabTEST,dc=us,dc=dg,dc=com
Primary Server GroupSearchPath:  groupsearchpath
Primary Server UserIDAttribute:  testuid
Primary Server UserNameAttribute:  usernameattribute
Primary Server GroupNameAttribute:  groupnameattribute
Primary Server GroupMemberAttribute:
groupmemberattribute
Primary Server UserObjectClass(optional):
userobjectclass
Primary Server GroupObjectClass:  groupclass

Alternate Server Name: 10.14.46.100
Alternate Server Port Number: 389
Alternate Server Protocol: ldap
Alternate Server ServerType:  LDAP
Alternate Server BindDn:  cn=root,dc=corp,dc=emc,dc=com
Alternate Server UserSearchPath:
ou=Group1,dc=corp,dc=emc,dc=com
Alternate Server GroupSearchPath:  groupsearchpath
Alternate Server UserIDAttribute:  useridattribute
Alternate Server UserNameAttribute:  usernameattribute
Alternate Server GroupNameAttribute:  groupnameattribute
Alternate Server GroupMemberAttribute:
groupmemberattribute
Alternate Server UserObjectClass(optional):
userobjectclass
Alternate Server GroupObjectClass:  groupclass
```

OUTPUT

None if the command succeeds; status or error information if it fails.

security -ldap -addrolemapping

Creates a new role mapping

PREREQUISITES

You must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **naviseccli security -ldap** command with the **-addrolemapping** subcommand creates a new role mapping entity for the corresponding external server. You must initialize system security and select a domain master before configuring LDAP connection settings. Consult with the LDAP administrator for your site to determine the LDAP/AD names of users and groups to which you want to map Unisphere roles. Once you have defined the server connection settings, and mapped the user's roles, users can log in to the system with their LDAP username/password. The roles are administrator, manager, monitor, security administrator, replication, local replication, and replication/recovery.

SYNTAX

security -ldap -addrolemapping IPaddress -name *name* **-type group|user -role** *role* [**-o**]

OPTIONS

IPaddress

Specifies the network IP address (IPv4) of the LDAP or AD server with the information required to authenticate users.

-name *name*

Specifies the name of the role that maps to Unisphere.

-type group|user

Specifies the type of role mapping. The group type of role mapping applies to a group of people. The user type of role mapping applies to only one individual.

-role *role*

Specifies the user/group role that maps to Unisphere.

-o

Executes the command without prompting for confirmation.

EXAMPLE

```
security -ldap -addrolemapping 10.5.4.250 -name ldap4ipv4 -type
user -role administrator
```

OUTPUT

None if the command succeeds; status or error information if it fails.

security -ldap -modifyrolemapping

Modifies the role mapping

PREREQUISITES

You must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **naviseccli security -ldap** command with the **-modifyrolemapping** subcommand modifies the user or group role mappings to an LDAP or AD service.

SYNTAX

security -ldap -modifyrolemapping IPaddress -name *name* **-type group|user -role** *role* [**-o**]

OPTIONS

IPaddress

Specifies the network IP address (IPv4) of the LDAP or the AD server.

-name *name*

Specifies the name of the role that maps to Unisphere.

-type group|user

Specifies the type of the role mapping to be modified. The group type of role mapping applies to a group of people. The user type of role mapping applies to only one individual.

-role *role*

Specifies the user/group role that maps to Unisphere.

-o

Executes the command without prompting for confirmation.

EXAMPLE

```
security -ldap -modifyrolemapping 10.5.4.250 -name test -type user
-role monitor
```

OUTPUT

None if the command succeeds; status or error information if it fails.

security -ldap -removerolemapping

Removes the role mapping entity

PREREQUISITES

You must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **naviseccli security -ldap** command with the **-removerolemapping** subcommand removes the role mapping entity from Unisphere for the corresponding external server. Only the Unisphere administrator can remove user or group role mappings to an LDAP or AD service.

You can delete all role mappings using the **-all** switch. To delete a particular role mapping, specify the **-name** and **-type** switch.

SYNTAX

```
security -ldap -removerolemapping IPaddress [-name name -type group|user]
| [-all] [-o]
```

OPTIONS

IPaddress

Specifies the network IP address (IPv4) of the LDAP or the Active Directory server.

-name *name* **-type group|user**

Deletes role mapping with a specified role mapping name and type. The group type of role mapping applies to a group of people. The user type of role mapping applies to only one individual.

-all

Deletes all role mappings.

-o

Executes the command without prompting for confirmation.

EXAMPLE

```
security -ldap -removerolemapping 10.5.4.250 -name test -type user
```

OUTPUT

None if the command succeeds; status or error information if it fails.

security -ldap -listrolemapping

Lists a role mapping entity

PREREQUISITES

You must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **naviseccli security -ldap** command with the **-listrolemapping** subcommand lists the role mapping entity for the corresponding external server. It displays the role mapping as a security administrator, administrator, manager, or monitor. You can use the **-name** switch to list a particular role mapping.

SYNTAX

security -ldap -listrolemapping IPaddress [**-name** *name*]

OPTIONS

IPaddress

Specifies the network IP address (IPv4) of the LDAP or the AD server with the information required to authenticate users.

-name *name*

Displays role mapping with the specified role mapping name.

EXAMPLE

```
security -ldap -listrolemapping 10.5.4.250
```

OUTPUT

```
Name: Test_1
Type: user
Role: administrator
Name: Test_2
Type: group
Role: security administrator
```

security -ldap -synchronize

Synchronizes the accounts

PREREQUISITES

You must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **naviseccli security -ldap** command with the **-synchronize** subcommand manually synchronizes the accounts with the current service.

SYNTAX

```
security -ldap -synchronize [-o]
```

OPTIONS

-o

Executes the command without prompting for confirmation.

OUTPUT

None if the command succeeds; status or error information if it fails.

security -ldap -bypasscert

Sets or gets the bypass certificate verification

PREREQUISITES

You must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **naviseccli security -ldap -bypasscert** command sets or gets the bypass certificate verification for LDAP servers.

SYNTAX

security -ldap -bypasscert

[**-set** 0|1 [**-o**]] | [**-get**]

OPTIONS

-set

Sets the bypass certificate verification for LDAP servers. Valid values are 0 (not bypass) and 1 (bypass).

-get

Gets the bypass certificate verification for LDAP servers.

-o

Executes the command without prompting for confirmation.

OUTPUT

None if the command succeeds; status or error information if it fails.

security -certificate -add

Imports the certificate

PREREQUISITES

You must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **security -certificate -add** command imports the certificate from the certificate file. Secure CLI supports BASE64PEM format certificate.

SYNTAX

security -certificate -add -file *filename*

OPTIONS

-file *filename*

Specifies the path of the certification on the local file system.

EXAMPLE

```
naviseccli security -certificate -add -file c:\Node1.cer
```

security -certificate -remove

Removes the specified certificate

PREREQUISITES

You must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **naviseccli security -certificate -remove** command removes the specified certificate in certificate store.

SYNTAX

security -certificate -remove [**-issuer** *issuer* **-serialnumber** *serial number*]|[**-all**]

OPTIONS

-issuer *issuer*

Specifies the issuer of the certificate that will be removed.

-serialnumber *serial number*

Specifies the certificate.

-all

Removes all certificates in the certificate store.

EXAMPLE

```
naviseccli security -certificate -remove -issuer CN=ICA1 1rst Intermediate
 CA - Signed by Root, OU=CSP, O=RSA, ST=MA,C=US

-serialNumber 00e2
```

security -certificate -list

Lists the certificates

PREREQUISITES

You must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **naviseccli security -certificate -list** command lists all certificates in the certificate store. Use the expire option to list only the expired certificate.

SYNTAX

```
security -certificate -list
[-showOnly expired]
```

OPTIONS

-showOnly expired

Lists only the expired certificates.

EXAMPLE

```
naviseccli security -certificate -list
```

OUTPUT

```
------------------------------------------------------------------------------

-------------
Subject:
CN=TrustedRoot,C=US,ST=MA,L=Hopkinton,EMAIL=rsa@emc.com,OU=CSP,O=RSA
Issuer:
CN=TrustedRoot,C=US,ST=MA,L=Hopkinton,EMAIL=rsa@emc.com,OU=CSP,O=RSA
Serial#:                  00d8280b0c863f6d4e
Valid From:           20090407135111Z
Valid To:               20190405135111Z
------------------------------------------------------------------------------

--------------
Subject:             CN=ICA1 1rst Intermediate CA - Signed by Root, OU=CSP,
 O=RSA, ST=MA,C=US
Issuer:                 CN=TrustedRoot,
C=US,ST=MA,L=Hopkinton,EMAIL=rsa@emc.com,OU=CSP,O=RSA
Serial#:                00e2
Valid From:        20090407135113Z
Valid To:            20190405135113Z
------------------------------------------------------------------------------

-------------
Subject:           CN=ICA1 2nd Intermediate CA,OU=CSP,O=RSA,ST=MA,C=US
Issuer:             CN=ICA1 1rst Intermediate CA - Signed by
Root,OU=CSP,O=RSA,ST=MA,C=US
Serial#:            00e3
Valid From:      20090407135113Z
Valid To:         20190405135113Z
------------------------------------------------------------------------------

--------------
Subject:        CN=node 1 CA - Signed by ICA1, OU=CSP, O=RSA, ST=MA,C=US
Issuer:          CN=ICA1 1rst Intermediate CA - Signed by Root, OU=CSP,
O=RSA, ST=MA,C=US
Serial#:                00e2
Valid From:        20090407135113Z
Valid To:            20190405135113Z
------------------------------------------------------------------------------

--------------
```

security -fipsmode -get

Retrieves FIPS mode

PREREQUISITES

For **naviseccli**, you must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **naviseccli security –fipsmode -get** command gets the information whether the current context of Unisphere is running on FIPS or non-FIPS mode.

SYNTAX

```
naviseccli security -fipsmode -get
```

OPTIONS

-get

Displays the FIPS mode.

OUTPUT

The output should be:

FIPS 140-2 compliant: ENABLED

or

FIPS 140-2 compliant: DISABLED

security -fipsmode -set

Sets FIPS mode

PREREQUISITES

For **naviseccli**, you must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **naviseccli security –fipsmode –set** command sets FIPS or non-FIPS mode of Unisphere.

SYNTAX

```
naviseccli security -fipsmode -set0|1[-o]
```

OPTIONS

-set 0|1

If the value is 0, the mode is set to Non-FIPS 140-2-compliant mode. If the value is 1, the mode is set to FIPS 140-2-compliant mode.

OUTPUT

None if the command succeeds; status or error information if the command fails.

Event Monitor commands

This section provides a brief overview of the event monitor and includes a list of commands you can use to configure and manage Event Monitor.

-portal -create

Adds a host agent to the portal system

PREREQUISITES

For **naviseccli**, you must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **naviseccli -portal -create** command adds the specified host agent to the specified portal system.

SYNTAX

eventmonitor -portal -create -system *portalsystemname* **-server** *hostagentname*

OPTIONS

-system *portalsystemname*

Specifies the portal system.

-server *hostagentname*

Specifies the host agent.

EXAMPLE

```
eventmonitor -portal -create -system cx380_123_227 -server 10.32.123.205
```

OUTPUT

None if the command succeeds; status or error information if it fails.

-portal -list

Lists the portal configurations

PREREQUISITES

For **naviseccli**, you must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **naviseccli -portal -list** command lists the portal system and its hosts.

SYNTAX

```
eventmonitor -portal -list
```

OUTPUT

Portal configuration is listed. Nothing is listed if the portal configuration is not available.

-portal -migrate

Migrates the portals

PREREQUISITES

For **naviseccli**, you must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **naviseccli -portal -migrate** command migrates the portal system. The host to which the portals are connected is migrated automatically.

SYNTAX

```
eventmonitor -portal -migrate -source source portal system name -dest des
tination portal system name
```

OPTIONS

-source *source portal system name*

Specifies the original portal configuration name.

-dest *destination portal system name*

Specifies the destination portal configuration name.

EXAMPLE

```
eventmonitor -portal -migrate -source cx380_123_223 -dest cx380_123_227
```

OUTPUT

None if the command succeeds; status or error information if it fails.

-portal -destroy

Deletes the host agent from the portal system

PREREQUISITES

For **naviseccli**, you must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **naviseccli -portal -destroy** command deletes the specified host agent from the specified portal system.

SYNTAX

eventmonitor -portal -destroy -system *portal system name* **-server** *hostname* [**-o**]

OPTIONS

-system *portal system name*

Specifies the portal system whose host is deleted.

-server *hostname*

Deletes the specified host agent.

-o

Executes the command without prompting for confirmation.

EXAMPLE

```
eventmonitor -portal -destroy -system cx380_123_227 -server
10.32.123.205
```

OUTPUT

None if the command succeeds; status or error information if it fails.

-template -list

Lists the templates

PREREQUISITES

For **naviseccli**, you must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **naviseccli eventmonitor -template** command with the **-list** function lists all the templates available in the template database of the target system.

SYNTAX

```
eventmonitor -template -list
```

OUTPUT

The templates in the database are listed; none if the templates are not available.

-template -import

Imports the template files

PREREQUISITES

For **naviseccli**, you must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **naviseccli eventmonitor -template** command with the **-import** function imports the template file from the file system to the template database.

SYNTAX

eventmonitor -template -import -templatefilename *filename*

OPTIONS

-templatefilename *filename*

Specifies the template to be imported to the template database of the target system.

EXAMPLE

```
eventmonitor -template -import -templatefilename
D:\Templates\Template_Test.tpl
```

OUTPUT

None if the command succeeds; status or error information if it fails.

-template -export

Exports the templates

PREREQUISITES

For **naviseccli**, you must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **naviseccli eventmonitor -template** command with the **-export** function exports the template from the template database to the file system.

SYNTAX

eventmonitor -template -export -templatename *templatename* **-filepath** *local filepath*

OPTIONS

-templatename *template name*

Specifies the template.

-filepath *localfilepath*

Specifies the local file path.

EXAMPLE

```
eventmonitor -template -export -templatename Template_Test
-filepath D:\Templates\
```

OUTPUT

None if the command succeeds; status or error information if it fails.

-template -destroy

Deletes the templates

PREREQUISITES

For **naviseccli**, you must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **naviseccli eventmonitor -template** command with the **-destroy** function deletes the specified template from the template database on the target system.

SYNTAX

eventmonitor -template -destroy -templatename *templatename* [**-o**]

OPTIONS

-templatename *templatename*

Deletes the specified template.

-o

Executes the command without prompting for confirmation.

EXAMPLE

```
eventmonitor -template -destroy -templatename Template_Test
```

OUTPUT

None if the command succeeds; status or error information if it fails.

-template -findconflict

Finds and resolves template conflicts

PREREQUISITES

For **naviseccli**, you must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **naviseccli eventmonitor -template** command with the **-findconflict** function lists the conflicting templates. The **-resolve** switch prompts you to resolve them.

SYNTAX

eventmonitor -template -findconflict [**-resolve**]

OPTIONS

-resolve

Resolves the template conflict.

EXAMPLE

```
eventmonitor -template -findconflict -resolve
```

OUTPUT

The sample output is as follows:

```
Event Template <template name> from host <host name> is
in conflict with the template in the database.
How do you want to resolve the conflict?
1. Update the template on the remote host.
2. Rename the template on the remote host.
3. Delete the template on the remote host.
4. Ignore this conflict.
Would you like to apply this option to all conflicting
template(s)?(y/n)
```

-template -swap

Swaps the two templates

PREREQUISITES

For **naviseccli**, you must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **naviseccli eventmonitor -template** command with the **-swap** function swaps the two specified templates. The system that used template A uses template B after the swap.

SYNTAX

eventmonitor -template -swap -templateName *template name A template name B* [**-keepResponses**]

OPTIONS

-templateName *template name A template name B*

Swaps the specified template names.

EXAMPLE

```
EventMonitor -template -swap -templateName Template_Test_1
Template_Test_2 -keepResponses
```

OUTPUT

None if the command succeeds; status or error information if it fails.

-monitor -addsystem

Adds the system to be monitored

PREREQUISITES

For **naviseccli**, you must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **naviseccli -monitor** command with the **-addsystem** function adds the specified system to the monitored system list of the specified host agent.

SYNTAX

eventmonitor -monitor -addsystem -server *hostname* **-system** *system name*

OPTIONS

-server *hostname*

Specifies the host agent.

-system *system name*

Specifies the system.

EXAMPLE

```
eventmonitor -monitor -addsystem -server 10.32.123.205
-system cx380_123_223
```

OUTPUT

None if the command succeeds; status or error information if it fails.

-monitor -removesystem

Removes the system from the monitor

PREREQUISITES

For **naviseccli**, you must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **naviseccli -monitor** command with the **-removesystem** function removes the specified system from the monitored system list of the specified host agent.

SYNTAX

eventmonitor -monitor -removesystem -server *hostname* **-system** *system name*

OPTIONS

-server *hostname*

Specifies the host agent.

-system *system name*

Specifies the system.

EXAMPLE

```
eventmonitor -monitor -removesystem -server 10.32.123.205
-system cx380_123_223
```

OUTPUT

None if the command succeeds; status or error information if it fails.

-monitor -listmapping

Lists the storage template mappings

PREREQUISITES

For **naviseccli**, you must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **naviseccli -monitor** command with the **-listmapping** function lists all the storage template mappings of the specified centralized or distributed monitor.

SYNTAX

eventmonitor -monitor -listmapping -server *hostname*|**-system** *storage system name*

OPTIONS

-server *hostname*

Lists the mapping information of the centralized monitor.

-system *system name*

Lists the mapping information of the distributed monitor.

EXAMPLE

```
eventmonitor -monitor -listmapping -server 10.32.123.205

eventmonitor -monitor -listmapping -system cx380_123_223
```

OUTPUT

The mapping information of the specified monitor is listed. None will be listed if the mapping is not available.

-monitor -applytemplate

Applies the template to the monitor

PREREQUISITES

For **naviseccli**, you must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **naviseccli -monitor** command with the **-applytemplate** function applies the template to the specific event monitor.

SYNTAX

eventmonitor -monitor -applytemplate [**-server** *hostname*] [**-system** *system name*] **-templatename** *templatename*

OPTIONS

-server *hostname*

Applies the template to the specified centralized monitor as a global template.

-system *system name*

Applies the template to the specified distributed monitor. If you specify both the server and the system, it applies the template to the specific system monitored by the centralized monitor.

-templatename *templatename*

Specifies the template name.

EXAMPLE

```
eventmonitor -monitor -applytemplate -server 10.32.123.205
-system cx380_123_223 -templatename Template_Test
```

OUTPUT

None if the command succeeds; status or error information if it fails.

-monitor -stoptemplate

Stops applying the template to the monitor

PREREQUISITES

For **naviseccli**, you must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **naviseccli -monitor command** with the **-stoptemplate** function stops applying the template to the specific event monitor.

SYNTAX

eventmonitor -monitor -stoptemplate [**-server** *hostname*] [**-system** *system name*] **-templatename** *templatename*

OPTIONS

-server *hostname*

Stops applying the template to the specified centralized monitor.

-system *system name*

Stops applying the template to the specified distributed monitor. If you specify both the server and the system, it stops applying the template to the specific system and the centralized monitor.

-templatename *templatename*

Specifies the template name.

EXAMPLE

```
eventmonitor -monitor -stoptemplate -server 10.32.123.205 -system
cx380_123_223 -templatename Template_Test
```

OUTPUT

None if the command succeeds; status or error information if it fails.

-monitor -getlog

Displays the event monitor log

PREREQUISITES

For **naviseccli**, you must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **naviseccli -monitor** command with the **-getlog** function displays the event monitor log. If the range of entries is not specified, the entire log is displayed with the oldest entry first.

SYNTAX

eventmonitor -monitor -getlog -server *hostname* [**-h**] [**+N**]|[**-N**]

OPTIONS

-server *hostname*

Specifies the host agent.

-h

Displays the getlog header.

+N

Displays the oldest n entries in the log, with the oldest entry first.

-N

Displays the newest n entries in the log, with the newest entry first.

OUTPUT

```
Audit Logging Service
01/27/2009 14:41:46 N/A (4612)NaviCLI.exe application was
started by the user, following was the application detail
Process Id : 2540
Path :C:\emc\Navisphere\6.28.20.1.5.1\msgbin\NaviCLI.exe
User : user1
Domain : cx420_47_52.

Audit Logging Service
01/27/2009 14:41:46 N/A (2004)Test Event
NaviEventMonitorApp
01/27/2009 14:41:48 N/A (4613)NaviCLI.exe application was
closed by the user, following was the application detail
Process Id : 2540
Path :C:\emc\Navisphere\6.28.20.1.5.1\msgbin\NaviCLI.exe
User : user1
Domain : cx420_47_52.
```

-monitor -enableresponse

Enables the response from the specified monitor

PREREQUISITES

For **naviseccli**, you must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **naviseccli -monitor** command with the **-enableresponse** function enables the response from the specified event monitor.

SYNTAX

eventmonitor -monitor -enableresponse -server *hostname* | **-system** *system name*

OPTIONS

-server *hostname*

Enables the response from the centralized monitor.

-system *system name*

Enables the response from the distributed monitor.

EXAMPLE

```
eventmonitor -monitor -enableresponse -system cx380_123_223

eventmonitor -monitor -enableresponse -server 10.32.123.205
```

OUTPUT

None if the command succeeds; status or error information if it fails.

-monitor -disableresponse

Disables the response from the specified monitor

PREREQUISITES

For **naviseccli**, you must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **naviseccli -monitor** command with the **-disableresponse** function disables the response from the specified event monitor.

SYNTAX

eventmonitor -monitor -disableresponse -server *hostname* | **-system** *system name* **-time** *duration min* [**-o**]

OPTIONS

-server *hostname*

Disables the response from the centralized monitor.

-system *system name*

Disables the response from the distributed monitor.

-time

Specifies the time in minutes.

-o

Executes the command without prompting for confirmation.

EXAMPLE

```
eventmonitor -monitor -disableresponse -system cx380_123_223
-time 30

eventmonitor -monitor -disableresponse -server 10.32.123.205
-time 30
```

OUTPUT

None if the command succeeds; status or error information if it fails.

-monitor -getlogsize

Gets the log size of the monitor

PREREQUISITES

For **naviseccli**, you must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **naviseccli -monitor** command with the **-getlogsize** function gets the log size of the event monitor.

SYNTAX

eventmonitor -monitor -getlogsize -server *hostname* | **-system** *system name*

OPTIONS

-server *hostname*

Gets the log size of the centralized monitor.

-system *system name*

Gets the log size of the distributed monitor.

EXAMPLE

```
eventmonitor -monitor -getlogsize -server 10.32.123.205

eventmonitor -monitor -getlogsize -system cx380_123_223
```

OUTPUT

None if the command succeeds; status or error information if it fails.

-monitor -setlogsize

Sets the log size of the monitor

PREREQUISITES

For **naviseccli**, you must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **naviseccli -monitor** command with the **-setlogsize** function changes the log size of Event Monitor.

SYNTAX

eventmonitor -monitor -setlogsize -server *hostname* | **-system** *system name* **-size** *logsize* [**-o**]

OPTIONS

-server *hostname*

Sets the log size of the centralized monitor.

-system *system name*

Sets the log size of the distributed monitor.

-size *logsize*

Specifies the log size in bytes.

-o

Executes the command without prompting for confirmation.

EXAMPLE

```
eventmonitor -monitor -setlogsize -server 10.32.123.205
-size 20000000
```

```
eventmonitor -monitor -setlogsize -system cx380_123_223
-size 20000000
```

OUTPUT

None if the command succeeds; status or error information if it fails.

-monitor -inserttestevent

Inserts an event in the log

PREREQUISITES

For **naviseccli**, you must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **naviseccli -monitor** command with the **-inserttestevent** function inserts an event into the Event Monitor event log.

SYNTAX

eventmonitor -monitor -inserttestevent -server *hostname*

OPTIONS

-server *hostname*

Specifies the host agent.

OUTPUT

None if the command succeeds; status or error information if it fails.

-monitor -responsetest

Creates an artificial event

PREREQUISITES

For **naviseccli**, you must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **naviseccli -monitor** command with the **-responsetest** function creates an artificial event to test the Event Monitor response.

SYNTAX

eventmonitor -monitor -responsetest

-server *hostname*

-email -smtpmailserver *smtpmailserver* **-destaddress** *destaddress* [**-subject** *subject*] [**-cc** *cc*] [**-message** *message*|**-file** *filename* [**-sender** *sender_email_addr*]

-emailpage -smtpmailserver *smtpmailserver* **-destaddress** *destaddress* [**-subject** *subject*] [**-cc** *cc*] [**-message** *message*|**-file** *filename*] [**-sender** *sender_email_addr*]

-modempage -destnumber *destnumber* **-msgnumber** *msgnumber* [**-comport** *comport*] [**-dialcommand** *dialcommand*] [**-initcommand** *initcommand*] [**-messagedelay** *mes sagedelay*]

-snmp -desthost *desthost* [**-device** *device*] [**-community** *community*]

OPTIONS

-server *hostname*

Specifies the host agent.

-smtpmailserver *smtpmailserver*

Specifies the SMTP mail server.

-destaddress *destaddress*

Specifies the destination email address.

[-subject *subject***]**

Specifies the subject of the email.

[-cc *cc***]**

The email address to which to send a cc (copy).

[-message *message* **|-file** *filename***]**

The *message* describes the event and **-file** specifies a file with descriptive text.

[-sender *sender_email_address*]

Specifies the sender address. If omitted, the CLI inserts the agent hostname as the *sender_email_address*.

-destnumber *destnumber*

Specifies the pager phone number (with area code).

-msgnumber *msgnumber*

Specifies the number that will appear on the pager display (with area code).

[-comport *comport*]

Specifies the PC COM port number. If omitted, the CLI assumes COM l.

[-dialcommand *dialcommand*]

Specifies the modem dial command to be used by the agent.

[-initcommand *initcommand*]

Specifies the modem dial command to be used by the agent. It allows for some custom modem configuration before the data is sent to it.

[-messagedelay *messagedelay*]

Specifies the delay between sending the destination phone number to the modem and sending the message to the modem. This allows enough time for the receiving modem to answer the all.

-desthost *desthost*

Specifies an SNMP management hostname.

-device *device*

Specifies the device represented by the SNMP management host.

-community *community*

Specifies a community on the SNMP managment host.

OUTPUT

Provides an output depending on the switches used; provides status or error information if it fails.

-monitor -reloadconfig

Reloads the template file

PREREQUISITES

For **naviseccli**, you must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **naviseccli -monitor** command with the **-reloadconfig** function reloads the template file.

SYNTAX

eventmonitor -monitor -reloadconfig -server *hostname*

OPTIONS

-server *hostname*

Specifies the host agent.

OUTPUT

None if the command succeeds; status or error information if it fails.

Virtual server commands

This section explains the virtual server commands to configure virtual center/ESX credentials.

Virtual server overview

The virtual server integration feature simplifies the process for assigning a system to the virtual servers and their virtual machines.

The virtual server commands identify and display the ESX server or Virtual Center (VC) server, and display the mapping between the LUN and the virtual machine. These commands let you configure VC/ESX credentials.

You must configure an ESX server that needs virtualization integration information with a system in the domain. To execute host agent commands, the host does not need be attached to the system, but network connectivity is required.

Table 10 on page 538 lists the virtual server commands.

Table 10. naviseccli virtual server commands

Command	Description
`server -volmap`	Lists the volume map information.
`server -update`	Updates the server information.
`server -getagent`	Displays the agent information.
`server -remoteconfig`	Displays the remote configuration information.
`server -register`	Displays the agent information on the host.
`hypervisor -addvirtualcenter`	Adds virtual center credentials.
`hypervisor -modifyvirtualcenter`	Modifies virtual center credentials.
`hypervisor -removevirtualcenter`	Removes virtual center credentials.
`hypervisor -addESX`	Adds ESX credentials.
`hypervisor -modifyESX`	Modifies ESX server properties.
`hypervisor -removeESX`	Removes ESX credentials.
`hypervisor -listESX`	Lists ESX servers.

hypervisor -addvirtualcenter

Adds virtual center credentials

PREREQUISITES

You must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **naviseccli hypervisor -addvirtualcenter** command adds the virtual center credentials. The virtual center credentials are stored in the system.

SYNTAX

```
naviseccli -h sp server -hypervisor -addvirtualcenter ipaddress -username
user
[-password password]
[-description description]
[-cert pathToCertificatefile]
[-o]
```

OPTIONS

ipaddress

Specifies the IP address of the virtual center server.

-username *user*

Specifies the username of the virtual center.

-password *password*

Specifies the password of the virtual center. If you do not type the password, the system prompts you to type it.

-description *description*

Maximum variable length is 128 characters and the minimum variable length is 0.

-cert *pathToCertificatefile*

Specifies the full pathname of trusted certificate file to be uploaded to the certificate store.

`-o`

Sends a prompt if you specify the incorrect username/password.

OUTPUT

None if the command succeeds; status or error information if it fails.

hypervisor -modifyvirtualcenter

Modifies virtual center credentials

PREREQUISITES

You must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **naviseccli hypervisor -modifyvirtualcenter** command modifies an existing virtual center server's credentials.

SYNTAX

```
naviseccli -h sp server -hypervisor -modifyvirtualcenter name | ipaddress
[-username user -password password] [o]
[-description description]
```

OPTIONS

name | ipadress

Specifies the name or the IP address of the virtual center server.

-username *user*

Specifies the new username of the virtual center.

-password *password*

Specifies the password of the virtual center.

-description

Maximum variable length is 128 characters and the minimum variable length is 0.

-o

Sends a prompt if you specify the incorrect username/password.

OUTPUT

None if the command succeeds; status or error information if it fails.

hypervisor -removevirtualcenter

Removes virtual center credentials

PREREQUISITES

You must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **naviseccli hypervisor -removevirtualcenter** command removes an existing virtual center server's credentials.

SYNTAX

```
naviseccli -h sp server -hypervisor -removevirtualcenter name | ipaddress
[-o]
```

OPTIONS

name | ipaddress

Specifies the name or the IP address of the virtual center server.

-o

Executes the command without prompting for confirmation.

OUTPUT

None if the command succeeds; status or error information if it fails.

hypervisor -addesx

Adds ESX credentials

PREREQUISITES

You must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **naviseccli hypervisor -addesx** command adds ESX credentials. You must specify the ESX credentials manually if the ESX server is not managed by the virtual center server.

SYNTAX

naviseccli -h sp server -hypervisor -addesx name | **ipaddress -username** *user* [**-password** *password*] [**-cert** *pathToCertificatefile*] [**-o**]

OPTIONS

-username *user*

Specifies the username of the ESX server.

-password *password*

Specifies the password of the ESX server.

-cert *pathToCertificatefile*

Specifies the full pathname of the trusted certificate file to be uploaded to the certificate store.

-o

Sends a prompt if you specify the incorrect username/password.

OUTPUT

None if the command succeeds; status or error information if it fails.

hypervisor -modifyesx

Modifies ESX server properties

PREREQUISITES

You must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **naviseccli hypervisor -modifyesx** command modifies an existing virtual center server's credentials.

SYNTAX

naviseccli -h sp server -hypervisor -modifyesx name | **ipaddress -username** *user* **-password** *password* [**-o**]

OPTIONS

name | **ipaddress**

Specifies the name or the IP address of the ESX server to be modified.

-username *user*

Specifies the new username of the ESX server.

-password *password*

Specifies the new password of the ESX server.

Note: The options **-username** and **-password** have to be specified to change either one of them.

-o

Sends a prompt if you specify the incorrect username/password.

OUTPUT

None if the command succeeds; status or error information if it fails.

hypervisor -removeesx

Removes ESX credentials

PREREQUISITES

You must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **naviseccli hypervisor -removeesx** command removes existing ESX server credentials.

SYNTAX

```
naviseccli -h sp server -hypervisor -removeesx name | ipaddress [-o]
```

OPTIONS

name | **ipaddress**

Specifies the name or the IP address of the ESX server to be removed.

-o

Executes the command without prompting for confirmation.

OUTPUT

None if the command succeeds; status or error information if it fails.

hypervisor -listesx

Lists ESX servers

PREREQUISITES

You must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **naviseccli hypervisor -listesx** command lists all servers with IP address and description.

SYNTAX

```
naviseccli -h sp server -hypervisor -listesx
```

OUTPUT

```
ESX Server(s):
Name:  nlpc12241.us.dg.com
IP Address:  10.14.12.241
Virtual center Managed ESX server(s):
Virtual Center IP Address:  10.14.12.82
Virtual Center Description:
Virtual Center IP Address:  10.14.12.248
Virtual Center Description:
```

hypervisor -bypassCert -set

Sets bypass certificate verification

PREREQUISITES

You must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **naviseccli hypervisor -bypassCert -set** command sets the bypass certificate verification for virtual servers.

SYNTAX

```
naviseccli -h sp server -hypervisor -bypassCert -set [0|1]
```

OPTIONS

-set

Sets the bypass certificate verification for virtual servers. Valid values are 0 (not bypass) and 1 (bypass).

OUTPUT

None if the command succeeds; status or error information if it fails.

hypervisor -bypassCert -get

Gets bypass certificate verification

PREREQUISITES

You must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **naviseccli hypervisor -bypassCert -get** command gets the bypass certificate verification for virtual servers.

SYNTAX

```
naviseccli -h sp server -hypervisor -bypassCert -get
```

OPTIONS

-get

Gets the bypass certificate verification for virtual servers.

OUTPUT

None if the command succeeds; status or error information if it fails.

Host Agent commands

This section explains the host agent commands to configure virtual center/ESX credentials.

server -volmap

Lists the volume map information

PREREQUISITES

You must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **naviseccli server -volmap** command lists the volume map information. If the host is an ESX server (ESX_1), then it displays the ESX server information (LUN to VM mappings) of all the systems attached to the host. If the specified host is a physical host, it displays lunmapinfo information for all systems attached to the host. Refer to the *EMC Navisphere CLI Reference* (P/N 300-003-628 Rev. A10) for information on the **lunmapinfo** command.

SYNTAX

naviseccli -h array_a server -volmap -host *ipaddress* [**-local**][**-vm**]

OPTIONS

-host *ipaddress*

Specifies the IP address of the attached host whose information is displayed.

-local

Displays only the attached host information.

-vm

Displays all ESX_1 mount points on systems A and B.

EXAMPLE

```
naviseccli server -volmap -host ipaddress
```

OUTPUT

```
naviseccli server -volmap -host ipaddress
```

Sample output (if the host is a physical host):

```
Logical Drives:             N\A
Physical Device:            \\.\PhysicalDrive13
LOGICAL UNIT WWN:
60:06:01:60:93:31:19:00:01:DC:1D:0B:07:0D:DB:11
LOGICAL UNIT NUMBER:  3
Current Owner: N\A
Default Owner: N\A
Trespassed:      N\A
LUN Capacity(Gigabytes):    .2
LUN Capacity(Blocks):       4194304

Logical Drives:             P:\
Physical Device:            \\.\PhysicalDrive14
LOGICAL UNIT WWN:
60:06:01:60:93:31:19:00:01:DC:1D:0B:07:0D:DB:12
LOGICAL UNIT NUMBER:  4
Current Owner: SP A
Default Owner: SP B
Trespassed:       Yes
LUN Capacity(Gigabytes):    1.2
LUN Capacity(Blocks):       2097152

naviseccli server -volmap -host ipaddress -local

Logical Drives:             F:\
Physical Device:            \\.\PhysicalDrive18
LOGICAL UNIT WWN:
60:06:01:60:36:F7:22:00:2A:48:A4:C1:57:0E:DE:11
SNAPSHOT admhost_snapshot1_0       ----- snapshot name
will replace LUN
Default Owner:              SP A
Default Owner:              SP A
Trespassed:                 NO
LUN Capacity(Gigabytes):    0
LUN Capacity(Blocks):       204800
```

Sample output (if the host is an ESX server):

```
ESX Server Info:
Name: nlpc12197.us.dg.com
IP address: 10.14.12.197

Device Id: vmhba1:0:1
Device Name: vmhba1:0:1

Datastore:N/A
LOGICAL UNIT WWN:
60:06:01:60:93:31:19:00:01:DC:1D:0B:07:0D:DB:11
LOGICAL UNIT NUMBER:  4
Current Owner: SP A
Default Owner: SP B
LUN Capacity(Gigabytes):    .2
LUN Capacity(Blocks):       4194304

naviseccli server -volmap -host ipaddress -vm
```

Sample output (if the host is an ESX server):

```
ESX Server Info:
Name: nlpc12197.us.dg.com
IP address: 10.14.12.197

Virtual Machine Info:
VM Name: Hard Disk 1
Guest Host Name:
Guest IP Address:
Guest OS:

Name: Hard Disk 1
Type: Mapped Raw LUN
File Size(MB):100
File Path: \[DataStore1]\VM1\hd1.vmdk
LUN Name: LUN  5
LUN ID:  5
Name: My virtual machine
Type: VMX Config File
File Size(MB): N/A
File Path: \[DataStore1]\VM1\hd1.vmdk
LUN Name:  N/A
LUN ID: N/A
```

server -update

Updates the server information

PREREQUISITES

You must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **naviseccli server -update** command polls and updates the physical and ESX servers attached to the system. It also displays the update status.

SYNTAX

```
naviseccli -h sp server-update [-host ipaddress [-rescandevices[-o]]]
[-all [-rescandevices[-o]]] [-status]
```

OPTIONS

-host *ipaddress*

Specifies the IP address of the host (physical host or ESX server). It polls and updates the host.

-all

Polls and updates all the hosts (physical and ESX server) attached to the system.

-status

Displays the status of all hosts polled in the last poll cycle.

-rescandevices

Rescans and then updates the servers. It displays the confirmation before proceeding.

-o

Overrides the confirmation.

EXAMPLE

```
naviseccli server -update -status
```

OUTPUT

```
Update Status:
Poll Servers started at 06-NOV-2008 16:19:53.
Poll Servers completed successfully at 06-NOV-2008 16:22:53
Processed 3 out of 3 servers
```

server -getagent

Gets the agent information

PREREQUISITES

You must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **naviseccli server -getagent** command lists the agent information on the host.

SYNTAX

naviseccli -h sp server -getagent -host *ipaddress*

OPTIONS

-host *ipaddress*

Specifies the IP address of an attached host. It is applicable for any host running the agent.

OUTPUT

```
Agent Rev: 6.29.75 (0.9)
```

server -remoteconfig

Gets the remote configuration information

PREREQUISITES

You must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **naviseccli server -remoteconfig** command displays and modifies the host agent configuration information. The command scans all the devices in the system on a remote host.

SYNTAX

naviseccli -h sp server -remoteconfig -host *ipaddress*

OPTIONS

-host *ipaddress*

Specifies the IP address of an attached host. It is applicable for any host running the agent.

-description

Gets/sets the contents of description field.

-contact

Gets/sets the contents of the contact field.

-dev

Displays the device name, system, comments, and the connection type (SCSI, TTY, and LAN).

-users

Displays information about the users.

-interval

Gets/sets the contents of the polling interval field. The valid range is 1 to 120.

-baudrate

Gets/sets the baud rate.

-logsize

Gets/sets the log size to be transferred.

-userexplicitdevnames

Gets/sets user explicit device names.

-write

Writes an image of the configuration file as it exists on the host.

-managedev

Adds the SCSI devices in the managed device list. Each device includes a device name, system name, and an optional description.

-open

Keeps the device handle open between requests. This improves or degrades the agent performance depending on the operating system.

-managetty

Adds the serial devices in the managed device list. Each device includes a device name, system name, and an optional description.

-managelan

Adds the LAN devices in the managed device list. Every device includes a device name, system name, and an optional description.

-adduser

Sets the users field. The format of the usernames for SP A/SP B is system@ipaddress of SPA/SPB ; separate these usernames with a space.

-unmanagedev

Removes the device from the managed device list.

-manageauto

Executes auto configuration (manages all SCSI devices).

-rmuser

Removes the specified users from the authorized user list.

-f

Reads an image of the configuration file as it exists on the host.

-reloadconfig

Reloads the agent configuration file without stopping and starting the agent. Once polling of the server has completed, the changes will be reflected.

-scan

Scans the devices in the system on a remote host.

OUTPUT

Provides output depending on the options used.

server -register

Calls the Navisphere Agent running on the server to push/registration to systems

PREREQUISITES

You must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **naviseccli server -register** command calls the Navisphere Agent running on the server to push/registration to systems.

SYNTAX

naviseccli -h sp server -register -host *ipaddress*

OPTIONS

-host *ipaddress*

Specifies the IP address of an attached host. It is applicable for any host running the agent.

OUTPUT

None if the command succeeds; status or error information if it fails.

Unisphere Server Utility

This section provides the CLI commands for Unisphere Server Utility tools.

Using the server utility command line to generate a high-availability report

The high-availability option determines if the server is configured for high availability by verifying that the server has at least one connection path to each system SP, and that PowerPath or some other failover software, such as DMP, VMware native, PV Links, or HP native failover is running. The utility will not detect any other native failover software, such as native multipath (MPIO) for Linux, Solaris, or Windows Server 2008.

Generate a high-availability report to:

- check the status of a server.
- prepare for software installation on a system.

Checking the status of a server

To periodically check the high-availability status of a server, issue the appropriate command for your operating system.

For UNIX servers:

```
naviserverutilcli hav[-directory | -d outputdirectory
```

where *outputdirectory* specifies the directory to which you want to deposit the report on the server. This switch is required only if you are running the server utility from the CD. Otherwise the report is automatically saved to the Unisphere Server Utility installation directory. If the server utility is installed on your server and you specify a directory, the directory you specify will override the server utility's installation directory.

For Windows servers:

1. Open a command window and enter one of the following:
   - `cd C:\Program Files\EMC\Unisphere Server Utility`
   - `cd C:\Program Files (x86)\EMC\Unisphere Server Utility`
2. Enter:

   ```
   naviserverutilcli hav[-directory | -d outputdirectory
   ```

   where *outputdirectory* specifies the directory to which you want to deposit the report on the server. This switch is required only if you are running the server utility from the CD. Otherwise the report is automatically saved to the Unisphere Server Utility installation

directory. If the server utility is installed on your server and you specify a directory, the directory you specify will override the server utility's installation directory.

3. For ESX servers, use the following additional switches to specify the ESX server or vCenter for which you want a report.

-esx *ipaddress*

Specifies the IP address of the VMware ESX Server's environment for which you want to generate a report.

-virtualcenter *ipaddress*

Specifies the IP address of the vCenter. You must also specify the -esx ipaddress for which you want to generate a report.

-vmuser *username*

Specifies the username for the ESX Server or vCenter.

-vmpassword *password*

Specifies the password for the ESX Server or vCenter.

Preparing for software installation on a system

If you are generating a high-availability report as a prerequisite for updating the system software, you need to upload this report to the system prior to installing the software on the system.

To generate and upload an HA report, issue the following command from the directory in which you installed the utility:

naviserverutilcli hav -upload -ip *IPaddress* **|-h** *IPaddress*|*network_name* **-user**|**-u** *username* **-password**|**-p** *userpassword* **-scope**|**-s** *scopelevel* **-secfilepath** *securityfilepath* **-port 443**|**2163**[**-directory**|**-d** *outputdirectory*] **-esx** *ipaddress* **-virtualcenter -virtualcenter** *ipaddress* **-vmuser** *username* **-vmpassword** *password*

-ip *IPaddress*

Specifies the IP address of an SP on the system to which you will upload the report. You cannot use this switch in conjunction with the **-h** switch.

-h *IPaddress* | *network_name*

Specifies the IP address or the network name of an SP on the system to which you will upload the report. You cannot use this switch in conjunction with the **-ip** switch.

-user|**-u** *username*

Specifies the login name for the system. You must use this switch in conjunction with the **-password|-p** and **-scope|-s** switches. You cannot use this switch in conjunction with the **-secfilepath** switch.

-password|-p *userpassword*

Specifies the password required to access the system. You must use this switch in conjunction with the **-user|-u** and **-scope|-s** switches. You cannot use this switch in conjunction with the **-secfilepath** switch.

-scope|-s *scopelevel*

Specifies the level of access the username and password has to the system: 0 = global; 1 = local; 2 = LDAP. You must use this switch in conjunction with the **-user|-u** and **-password|-p** switches. You cannot use this switch in conjunction with the **-secfilepath** switch.

-secfilepath *securityfilepath*

Searches the security file for the specified IP address. If the utility does not find the specified IP address, then the utility will use the default entry in the security file. A security file is required to run this switch. For information on how to create a security file, refer to the EMC Navisphere Command Line (CLI) Reference guide. You cannot use this switch in conjunction with the **-user|-u**, **-password|-p**, and **-scope|-s** switches.

-port 443|2163

Specifies the Navisphere Management Server port number. The default port is 443.

-directory|-d *outputdirectory*

Specifies the directory to which you want to deposit the report on the server. This switch is required only if you are running the server utility from the CD. Otherwise the report is automatically saved to the Navisphere Server Utility installation directory.

If the server utility is installed on your server and you specify a directory, the directory you specify will override the server utility's installation directory.

-esx *ipaddress*

Specifies the IP address of the VMware ESX Server's environment for which you want to generate a report.

-virtualcenter *ipaddress*

Specifies the IP address of the Virtual Center. You must also specify the -esx ipaddress for which you want to generate a report.

-vmuser *username*

Specifies the username for the ESX Server or Virtual Center.

-vmpassword *password*

Specifies the password for the ESX Server or Virtual Center.

After uploading the HA report

In addition to running the server utility to validate server high availability, we strongly recommend that you perform the following manual checks:

Verify support of software and hardware

Make sure that you have verified that all software and hardware are supported according to the EMC E-Lab™ Interoperability Navigator and support matrices. This tool does not verify that you are running supported switch firmware, nor that you are using redundant switches (recommended).

Upgrading system software

If you are about to perform a system online software upgrade or you added an HBA, a LUN, or changed connectivity (added a path or changed zoning):

- Make sure that you have validated all software and hardware that are supported and interoperable according to EMC E-Lab Interoperability Navigator and support matrices.
- Verify that all LUNs (virtual disks) that your servers will access during the upgrade are under path management software control. For servers running PowerPath and DMP, see the Failover Software section on the Details tab of the report and locate these LUNs.

Unisphere Initialization Utility

This section provides the CLI commands for Unisphere Initialization Utility tools.

Using the command line initialization utility

For Fibre Channel systems, use the Unisphere Initialization Utility to discover systems and set network parameters (IP address, subnet mask, and default gateway). In addition, for iSCSI systems with iSCSI data ports attached to Windows server, use the utility to set network parameters for these ports.

You can install the utility on a server or other host such as an off-array management station. The only requirement is that the host be connected to the same network subnet as the system management ports.

After you start the command line version of the initialization utility, use the naviinittoolcli command with any of the switches below.

eula [**-language** *language*] **discover** [**-all**] [**-xml**]

configure **-serial** *serialnumber* [**-file** *filename*]
[**-ipa** *spAIpaddress* |**-sphosta** *spAhostname*] [**-ipb** *spBIpaddress* |
-sphostb *spBhostname*] [**-mask** *subnetmask*] [**-gateway** *gatewayaddress*]
[**-user** *username*] [**-password** *password*] [**-storagename** *storageName*]
[**-ipv6mode** |**automatic** |**disable** | [**manual** [**-globalprefix** *prefix*
[**-ipv6gateway** *ipv6gateway*]] [**-help**]

where:

eula

Displays the EMC end-user license agreement (EULA) in the specified language.

-language *language*

The default language is English. Currently, the only valid language is English.

discover

Discovers and displays a list of partially initialized systems.

-all

Discovers and displays a list of initialized and partially initialized systems.

-xml

Displays the output in xml format.

configure

Specifies the network parameters for the specified system.

-serial *serialnumber*

Specifies the serial number of the system you want to initialize.

-file *filename*

Specifies the name of the file that will store all the network parameters.

-ipa *spAipaddress* | **-sphosta** *spAhostname*

Specifies the IP address of SP A, or the server name for SP A for the specified system.

-ipb *spBipaddress* | **-sphostb** *spBhostname*

Specifies the IP address of SP B, or the server name for SP B for the specified system.

-mask *subnetmask*

Specifies the subnet mask for the specified system.

-gateway *gateway*

Specifies the gateway for the specified system.

-user *username*

Specifies the system login username.

-password *password*

Specifies the system login password.

-storagename *storagename*

Specifies the storage name for the specified system.

-help

Displays the help screen and does not start the initialization process.

-ipv6mode automatic | **disable** | **[manual -globalprefix** *prefix* | **-ipv6gateway** *ipv6gateway***]**

Specifies the configuration type for the IPv6 network. Refer to the IPv6 configuration type table for details.

3

Virtual Pools Commands

This chapter provides a brief overview of the Virtual Pools feature and describes the storage pool and thin commands that you can use if this feature is enabled on your system.

Major topics include:

Virtual Pools overview

The Virtual Pools feature allows you to allocate storage using thick and thin LUNs within pools and requires that the thin provisioning enabler be installed on the system. Thick LUNs and thin LUNs can reside within the same pool and they share the pool's storage capacity. Both thick and thin LUNs can be easily provisioned, expanded, and compressed via the Unisphere interface.

A thin LUN lets you assign more storage capacity to a host than is physically available. Storage is assigned to the server in a capacity-on-demand method from a shared pool. A thin LUN competes with other LUNs in the pool for the available pool storage. The system software monitors and adds storage capacity, as required, to each pool, not each LUN. This simplifies the creation and allocation of storage capacity.

Note: The actual consumed capacity and rate of consumption for the thin LUN can vary depending on the attached host file system or the application using the LUN. This is a normal condition typical of most thin provisioning services.

A thick LUN consumes all of its assigned capacity at the time it is created.

Current thin provisioning restrictions

- Virtual Pools is not supported for MirrorView/A, MirrorView/S or SAN Copy replication software.
- Thin LUNs cannot be used in a reserved LUN pool or as a clone private LUN (CPL).
- Thin LUNs cannot be a component in a metaLUN.
- Pools support RAID 5, RAID 6 and RAID 1/0 types - RAID 5 is the default RAID type.
- Pools do not support the hot spare RAID type.
- Pools support Flash drives, FC, ATA, and SATA drives.

Pools

A pool contains a set of disks that can include any of the following drive types - Flash, FC, ATA, and SATA. The maximum number of disks for a pool depends on system type. For more efficient performance, we recommend that all disks in the pool have the same capacity and RAID type. RAID 5 is the default RAID type for a pool. A storage pool shares its user capacity with all the LUNs in the pool. You can expand the user capacity of a pool by adding disks to it.

Note: Vault drives (the first five drives in a system) cannot be part of a pool. The Unisphere dialogs and wizards will not let you select these drives.

Table 11. Pool LUN limits

Minimum user capacity	1 BC
Maximum user capacity	16 TB

naviseccli thin provisioning commands

Command	Description
Storage pool commands	
storagepool -create	Creates a thin pool.
storagepool -list	Lists the thin pools properties.
storagepool -destroy	Deletes a thin pool.
storagepool -modify	Modifies thin pool properties.
storagepool -expand	Expands the thin pool on the system.
storagepool -cancelexpand	Cancels the expansion, if the expansion has failed.
storagepool -feature -info	Lists out the parameters and settings of the mapped driver and certain configuration information.
LUN commands	
lun -create	Creates a pool LUN or a thin LUN depending if the **-type** switch is specified.
lun -destroy	Deletes a LUN.
lun -list	Lists the LUNs on a system and their properties.
lun -modify	Modifies the LUN properties.
lun -expand	Expands a pool LUN.

storagepool -create

Creates the thin pool

PREREQUISITES

For **naviseccli**, you must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **naviseccli storagepool -create** command creates the thin pool. A thin pool contains physical disks on which you bind thin LUNs. You can create more than one thin pool on a system, each with a different set of disks. There are two types of storage pools: Thin pools and RAID groups. A thin pool contains thin LUNs. You must specify the RAID type at the time of creation of thin pool.

SYNTAX

```
naviseccli storagepool -create -disks diskslist -rtype raidType
[-description description]
[-name name] [-prcntFullThreshold threshold]
[-skipRules]
[-autoTiering scheduled|manual]
[-fastcache on|off]
```

OPTIONS

-disks

Specifies the list of disks in *Bus X Enclosure Y Disk Z* format. If you do not specify Bus in the disk format, Bus 0 is assumed.

-rtype

Specifies the type of RAID group of the thin pool. The valid RAID groups are r_5 and r_6.

-description

Sets the description for the thin pool to be created. The character length ranges from 0 to 255.

-name

Sets the unique name for the thin pool. The character length ranges from 1 to 64.

-prcntFullThreshold

Specifies the percentage of the thin pool to be used before the system generates the alerts. The percentage ranges from 1 to 84. The default value is 70%.

-skipRules

Skips the best practices check while creating the thin pools. If you do not specify this option, the thin pool creation may fail due to any error checked in the thin rules. The default value is **FALSE**.

-autoTiering scheduled|manual

Sets the auto-tiering state to scheduled or manual for the storage pool. The default auto-tiering state is manual.

-fastcache on|off

Enables or disables the FAST Cache for the entire storage pool. The default value is enabled.

EXAMPLE

This command creates a thin pool with three disks.

```
Unisphere

naviseccli -h ss1_spa storagepool -type thin -create -disks  0_1_B2 0_1_B3
 0_1_B4 -rtype r_5
```

OUTPUT

None if the command succeeds; status or error information if initiating the command fails.

storagepool -list

Lists the thin pool properties and RAID groups

PREREQUISITES

For **naviseccli**, you must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **naviseccli storagepool -list** command lists the thin pool properties and RAID groups. For RAID group information, see getrg on page 216.

If you do not specify the options, the system displays all the thin pool properties.

SYNTAX

```
naviseccli storagepool -list [-id poolID|-name poolName][-availableCap]
[-consumedCap] [-currentOp] [-description] [-disks] [-diskType] [-luns]
[-opState] [-opStatus] [-prcntOp] [-rawCap] [-rtype] [-prcntFullThreshold]
[-state] [-status] [-subscribedCap] [-userCap] [-prcntFull][-autoTiering]
[-tiers] [-fastcache] [-all]
```

OPTIONS

-id *poolID*|**-name** *poolName*

Displays the name or ID of the thin pool with the specified name or ID. You cannot use the options **-id** and **-name** together.

-availableCap

Displays the free shared capacity (in blocks and GB).

-consumedCap

Displays the total allocated capacity in the shared capacity of the thin pool. The consumed capacity of a thin pool includes storage used by MLU for maintaining metadata (mapping info).

-currentOp

Displays the current operation.

-description

Returns the description of the thin pool.

-disks

Lists the disks used in each thin pool on the system. The disks are listed in *Bus_Enclosure_BankSlot* format, with each disk on a new line.

-diskType

Displays the disk type of the components in the pool. If the components have different types, the system displays

```
Mixed.
```

-luns

Lists the IDs of all thin LUNs in the thin pool.

-opState

Displays the current operation state. The system displays N/A, if the current operation state cannot be determined.

-opStatus

Displays the additional descriptive information for the current state of the thin pool.

-prcntOp

Displays the additional descriptive information for the current state of the thin pool operation in progress. If there is no operation, the system displays

```
0.
```

-rawCap

Displays the raw capacity of the thin pools.

-rtype

Lists the thin pool RAID type.

-prcntFullThreshold

Displays the user modifiable used space threshold, beyond which the system generates the alerts.

-state

Displays the state of the thin pool.

-status

Displays the information for the current state of the thin pool.

-subscribedCap

Displays the host-visible capacity of the thin pool.

-userCap

Displays the user-accessible capacity of the thin pool.

-prcntFull

Displays the used percentage.

-autoTiering

Displays the auto-tiering state (scheduled/manual)

-tiers

Displays the tier name, RAID type, capacity, and disk information for each tier. If auto-tiering is enabled, the data to be relocated up/down will also be displayed.

-fastcache

Lists the FAST Cache state of the storage pool.

-all

Displays all the storage pool information, including the tiers (always) and auto-tiering state (if the auto-tiering enabler has been installed).

OUTPUT

```
Thin Pool Name: Thin Pool 0
Thin Pool ID: 0
Raid Type: r_5
Percent Full Threshold: 70
Description:
Disk Type: Fibre Channel
State: Ready
Status: OK(0x0)
Current Operation: None
Current Operation State: N/A
Current Operation Percent Completed: 100
Raw Capacity (Blocks): 1401733120
Raw Capacity (GBs): 668.398
User Capacity (Blocks): 1111558400
User Capacity (GBs): 530.032
Consumed Capacity (Blocks): 50334720
Consumed Capacity (GBs): 24.001
Available Capacity (Blocks): 1061223680
Available Capacity (GBs): 506.031
Total Subscribed Capacity (Blocks): 106665345021
Total Subscribed Capacity (GBs): 50862.000
Percent Subscribed: 9596.018
Oversubscribed by (Blocks): 105553786621
Oversubscribed by (GBs): 50331.968
Disks:
Bus 0 Enclosure 0 Disk 6
Bus 0 Enclosure 0 Disk 8
Bus 0 Enclosure 0 Disk 5
Bus 0 Enclosure 0 Disk 7
Bus 0 Enclosure 0 Disk 9
LUNs: 302,3,5,300,9,12,11,2,8,10,301
```

storagepool -destroy

Destroys the thin pool

PREREQUISITES

For **naviseccli**, you must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **naviseccli storagepool -destroy** command deletes a thin pool. You must specify the thin pool ID or the thin pool name to be deleted from the system.

SYNTAX

naviseccli storagepool -destroy -id *poolID* |**-name** *poolName* [**-o**]

OPTIONS

-id *poolID* |**-name** *poolName*

Specifies the thin pool ID or name to be destroyed. You cannot use the options **-id** and **-name** together.

-o

Executes the command without prompting for confirmation.

OUTPUT

None if the command succeeds; status or error information if the command fails.

storagepool -modify

Modifies the thin pool

PREREQUISITES

For **naviseccli**, you must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **naviseccli storagepool -modify** command lets you modify certain properties of an existing thin pool. You must specify at least one property of the thin pool to be modified.

SYNTAX

naviseccli storagepool -modify -id *poolID*| **-name** *poolName*[**-newName** *newName*] [**-description** *description*] [**-fastcache on|off**] [**-prcntFullThreshold** *threshold*] [**-autotiering scheduled|manual**] [**-o**]

OPTIONS

-id *poolID* | **-name** *poolName*

Specifies the thin pool ID or name to be modified. You cannot use the options **-id** and **-name** together.

-newName

Sets the unique name for the thin pool. The character length ranges from 1 to 64.

-description

Sets the new description of the thin pool. The character length ranges from 0 to 255.

-fastcache on|off

Modifies the FAST Cache configuration of the storage pool.

-prcntFullThreshold

Specifies the new user capacity threshold, beyond which the system generates the alerts. The value ranges from 1 to 84. The default value is 70%.

-autotiering scheduled|manual

Sets the auto-tiering state to scheduled or manual for the storage pool.

`-o`

Executes the command without prompting for confirmation.

OUTPUT

None if the command succeeds; status or error information if it fails.

storagepool -expand

Expands thin pool capacity

PREREQUISITES

For **naviseccli**, you must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **naviseccli storagepool -expand** command lets you expand the physical capacity of the thin pool on the system.

SYNTAX

naviseccli storagepool -expand -id *poolID*| **-name** *poolName* **-disks** *disksList* [**-skipRules**] [**-o**]

OPTIONS

-id *poolID* | **-name** *poolName*

Specifies the thin pool ID or name to be expanded. You cannot use the options **-id** and **-name** together.

-disks

Specifies the list of disks in *Bus_Enclosure_BankSlot* notation. If you do not specify bus in the format, Bus 0 is assumed.

-o

Executes the command without prompting for confirmation.

-skipRules

Skips the best practices check while expanding thin pools. If you do not specify this option, the thin pool expansion may fail due to any error checked in the thin rules. The default value is **FALSE**.

OUTPUT

None if the command succeeds; status or error information if the command fails.

storagepool -cancelexpand

Cancels a failed expansion

PREREQUISITES

For **naviseccli**, you must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **naviseccli storagepool -cancelexpand** command lets you cancel a failed expansion on a storage pool. You must specify the thin pool ID or thin pool name to cancel the expand operation.

SYNTAX

naviseccli storagepool -cancelexpand -id *poolID*| **-name** *poolName*

OPTIONS

-id *poolID* | **-name** *poolName*

Specifies the thin pool ID or name. You cannot use the options **-id** and **-name** together.

OUTPUT

None if the command succeeds; status or error information if the command fails.

storagepool -feature -info

Lists the pool configuration information

PREREQUISITES

You must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **storagepool -feature -info** command displays the pool configuration information. If the options are not specified, then all the values are displayed.

SYNTAX

```
storagepool -feature -info [-isVirtualProvisioningSupported] [-maxPools]
[-maxDiskDrivesPerPool] [-maxDiskDrivesAllPools] [-maxDiskDrivesPerOp]
[-maxPoolLUNs] [-minPoolLUNSize] [-maxPoolLUNSize] [-numPools] [-numPoolLUNs]
[-numThinLUNs] [numDiskDrivesAllPools] [-availableDisks]
```

OPTIONS

-isVirtualProvisioningSupported

Specifies whether the thin enabler is installed on the system.

-maxPools

Displays the maximum number of the storage pools that can be created on the system.

-maxDiskDrivesPerPool

Specifies the maximum number of the disk drives in a pool.

-maxDiskDrivesAllPools

Specifies the maximum number of the disk drives in all pools.

-maxDiskDrivesPerOp

Specifies the maximum number of the disk drives used per operation.

-maxPoolLUNs

Displays the maximum number of storage pool LUNs that can be created on the system.

-minPoolLUNSize

Displays the minimum pool LUN size supported (as reported by the MLU driver) in blocks and MBs.

-maxPoolLUNSize

Displays the maximum pool LUN size supported (as reported by the MLU driver) in blocks and TBs.

-numPools

Displays the current number of storage pools created on the system.

-numPoolLUNs

Displays the current number of storage pool LUNs created on the system.

-numThinLUNs

Displays the total number of all pool LUNs created that are thin and non-thin.

numDiskDrivesAllPools

Displays the number of disk drives used in all pools.

-availableDisks

A line feed separated list of disks that are available for use by the Virtual Pools feature.

OUTPUT

```
Is Virtual Provisioning Supported:  true
Max. Pools:  120
Max. Disks Per Pool:  120
Max. Disks for all Pools:  0
Max. Disks per Operation:  120
Max. Pool LUNs:  4094
Min.  Pool LUN Size(Blocks):  2097152
Max. Pool LUN Size(Blocks):  30064771072
Max. Pool LUN Size(GBs):  14336.000
Total Number of  Pools:  1
Total Number of  Pool LUNs:  0
Total Number of all Pool LUNs that are thin:  20
Total Number of all Pool LUNs that are non-thin:  20
Number of Disks used in Pools:    0
Available Disks:
Bus 1 Enclosure 1 Disk 9
Bus 1 Enclosure 1 Disk 8
Bus 1 Enclosure 1 Disk 7
Bus 1 Enclosure 1 Disk 6
Bus 1 Enclosure 1 Disk 5
Bus 1 Enclosure 1 Disk 4
Bus 1 Enclosure 1 Disk 3
Bus 1 Enclosure 1 Disk 2
Bus 1 Enclosure 1 Disk 1
Bus 1 Enclosure 1 Disk 0
Bus 1 Enclosure 0 Disk 9
Bus 1 Enclosure 0 Disk 8
Bus 1 Enclosure 0 Disk 7
Bus 1 Enclosure 0 Disk 6
Bus 1 Enclosure 0 Disk 5
Bus 1 Enclosure 0 Disk 4
Bus 1 Enclosure 0 Disk 3
Bus 1 Enclosure 0 Disk 2
Bus 1 Enclosure 0 Disk 1
Bus 1 Enclosure 0 Disk 0
Bus 0 Enclosure 0 Disk 14
Bus 0 Enclosure 0 Disk 13
Bus 0 Enclosure 0 Disk 12
Bus 0 Enclosure 0 Disk 11
Bus 0 Enclosure 0 Disk 10
```

lun -create

Creates a LUN

PREREQUISITES

This command is available only on subsystems running Navisphere version 6.30 and later.

To create thin LUNs, you must have the Thin Provisioning Enabler installed on the subsystem.

DESCRIPTION

The **naviseccli lun -create** command lets you create pool LUNs or thin LUNs in the storage pool.

SYNTAX

```
lun -create [-type Thin|nonThin]
-capacity capacity [-sq mb|gb|tb|bc]
-poolId storagePoolID |-poolname  storagePoolName -sp  SPID
[-aa autoAssignment]
[-l lunNumber]
[-name lunName]
[-offset logicalBlockAddress]
[-tieringPolicy noMovement|autoTier|highestAvailable|lowestAvailable]
[-initialTier optimizePool|highestAvailable|lowestAvailable]
```

OPTIONS

-type Thin|nonThin

Specifies whether a thin LUN or pool LUN (non-thin LUN) is created. If not specified and **poolID** or **poolName** is provided, a pool LUN will be created.

-capacity *capacity*

Specifies the storage capacity of the LUN.

-sq mb|gb|tb|bc

Specifies the size qualifier for the capacity. The valid values are gb, tb, and bc. The default value is GB.

-poolId *storagePoolID*|**-poolName** *storagePoolName*

Specifies the storage pool ID or storage pool name in which the new LUN will be created.

-sp *SPID*

Specifies the default SP to which the new LUN must belong. The valid values are A and B.

-aa *autoAssignment*

Specifies whether auto assignment is enabled by default or not. The valid values are 1 (yes) and 0 (no). The default value is 0.

-l *lunNumber*

Specifies the LUN number. The lower limit is 0 and the upper limit is the number of LUNs supported on the platform. The default value is the next lowest available value.

-name *lunName*

Specifies the LUN name. The name has to be unique amongst the pool LUNs. If you do not specify a name, the system defaults to LUN <id>.

-offset *logicalBlockAddress*

Sets the LUN's starting Logical Block Address (LBA) to begin at a specified offset location. The valid value is any unsigned decimal number. The default value is 0.

-tieringPolicy noMovement|autoTier|highestAvailable|lowestAvailable

Sets the auto-tiering policy. If the auto-tiering policy is not set when creating the LUN, the default policy will depend on the initialTier settings. The auto-tiering policy can be set to:

noMovement	No data relocation between tiers but the initial tier is used to guide initial placement of data.
autoTier	Slices are subject to relocation based on the stats collected. This setting requires that the initial tier also be set to optimize pool.
highestAvailable	Slices are subject to relocation with a bias to the highest tier. This setting requires that the initial tier also be set to the highest available tier.
lowestAvailable	Slices are subject to relocation with a bias to the lowest tier. This setting requires that the initial tier also be set to the lowest available tier.

-initialTier optimizePool|highestAvailable|lowestAvailable

Sets the initial tier preference.

optimizePool	No preference is specified and the default data placement algorithm applies.
highestAvailable	Sets the preferred tier for initial data placement to be the highest tier.
lowestAvailable	Sets the preferred tier for initial data placement to be the lowest tier.

OUTPUT

Returns 0 if the command succeeds; status or error information if it fails.

lun -modify

Modifies the LUN properties

PREREQUISITES

You must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **naviseccli lun -modify** command lets you modify the properties of an existing LUN. At least one property to modify a LUN should be specified to issue this command. The **lun -modify** command provides the same options for all pool LUNs.

SYNTAX

```
lun -modify -l lunNumber|-name lunName
[-aa Autoassign]
[-newname lunName]
[-sp newDefaultSPID]
[-tieringPolicy noMovement|autoTier|highestAvailable|lowestAvailable]
[-initialTier optimizePool|highestAvailable|lowestAvailable] [-o]
```

OPTIONS

-l *lunNumber*

Specifies the LUN number. The valid value is a number that represents an existing LUN.

-name *lunName*

Specifies the LUN name. The name has to be unique among the LUNs in the storage pool.

-aa *Autoassign*

Specifies whether auto assignment is enabled by default or not. The valid values are 1 (yes) and 0 (no).

-newname *lunName*

Specifies the new LUN name. The name has to be unique among the LUNs in the storage pool.

-sp *newDefaultSPID*

Specifies the default SP to which the LUN belongs. The valid values are A and B. If the value is changed from the allocation owner, a prompt displays a warning about potential performance impact. Select Yes to proceed.

-tieringPolicy noMovement|autoTier|highestAvailable|lowestAvailable

Modifies the auto-tiering policy. The auto-tiering policy can be set to:

noMovement	No data relocation between tiers but the initial tier is used to guide initial placement of data.
autoTier	Slices are subject to relocation based on stats collected. This setting requires that the initial tier also be set to optimize pool.
highestAvailable	Slices are subject to relocation with a bias to the highest tier. This setting requires that the initial tier also be set to the highest available tier.
lowestAvailable	Slices are subject to relocation with a bias to the lowest tier. This setting requires that the initial tier also be set to the lowest available tier.

-initialTier optimizePool|highestAvailable|lowestAvailable

Sets the initial tier preference.

optimizePool	No preference is specified and the default data placement algorithm applies.
highestAvailable	Sets the preferred tier for initial data placement to be the highest tier.
lowestAvailable	Sets the preferred tier for initial data placement to be the lowest tier.

OUTPUT

Returns 0 if the command succeeds; status or error information if it fails.

lun -expand

Expands a LUN

PREREQUISITES

You must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **naviseccli lun -expand** lets you expand a pool LUN. This command will not work for FLARE LUNs. If the new capacity specified is higher than the existing capacity and the requirements for expansion are met, the LUN would expand. If the new capacity is less than the existing capacity, an error message will be displayed.

SYNTAX

lun -expand -l *lunNumber*|**-name** *lunName* **-capacity** *capacity* [**-sq mb|gb|tb|bc**][**-o**]

OPTIONS

-l *lunNumber*

Specifies the LUN number. The valid value is a number that represents an existing LUN.

-name *lunName*

Specifies the LUN name. The name has to be unique among the pool LUNs.

-capacity *capacity*

Specifies the new capacity of the LUN. The new capacity should be higher than the existing capacity for LUN expansion.

-sq mb|gb|tb|bc

Specifies the size qualifier for the capacity. The valid values are mb, gb, tb, and bc. The default value is GB.

OUTPUT

Returns 0 if the command succeeds; status or error information if it fails.

lun -destroy

Destroys a LUN

PREREQUISITES

You must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **naviseccli lun -destroy** command lets you destroy a LUN. The LUN number or LUN name is used to destroy any type of LUN since they are unique across all LUNs in the storage pools.

SYNTAX

lun -destroy -l *lunNumber*|**-name** *lunName* [**-o**]

OPTIONS

-l *lunNumber*

Specifies the LUN number.

-name *lunName*

Specifies the LUN name.

OUTPUT

Returns 0 if the command succeeds; status or error information if it fails.

lun -list

Lists the LUN properties

PREREQUISITES

You must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **naviseccli lun -list** lets you list all the LUN properties. If the options are not specified, then all the values will be returned for all the LUNs. If only one option is specified, it will be displayed along with the Logical Unit Number and Name.

SYNTAX

lun -list [**-l** *lunNumber*|**-name** *lunName*] | [**-showOnly Thin|nonThin|Compressed|nonCompressed**]
[**-aa**] [**-alowner**] [**-at**] [**-userCap**] [**-consumedCap**] [**-default**] [**-drivetype**] [**-offset**] [**-rtype**] [**-state**] [**-status**] [**-owner**] [**-poolName**] [**-uid**] [**-opDetails**] [**-isPoolLun**] [**-isThinLUN**] [**-isCompressed**] [**-isPrivate**] [**-featureData**] [**-perfData**] [**-tieringPolicy**] [**-initialTier**] [**-tiers**] [**-all**]

OPTIONS

-l *lunNumber*

Specificies the LUN number in unsigned decimal format. If the LUN number is not found, an error message will be returned indicating the LUN may not exist.

-name *lunName*

Specifies the LUN name. If the LUN name is not found, an error message will be returned indicating the LUN may not exist.

-showOnly Thin|nonThin|Compressed|nonCompressed

Specifies the types of LUNs to be listed. The value Thin lists all thin LUNs, nonThin lists all non-thin LUNs, Compressed shows all compressed LUNs and nonCompressed shows all non-compressed LUNs. The options Compressed and NonCompressed will be shown in the command usage even if the compression feature is not enabled.

-aa

Specifies the auto assign property.

-alowner

Specifies the allocation owner of the LUN.

-at

Specifies the auto-trespass property.

-userCap

Specifies the user (host visible) capacity of the LUN in blocks and GBs.

-consumedCap

Specifies the consumed capacity of the LUN. The consumed capacity is always larger than the user capacity for pool LUNs.

-default

Specifies the default owner of the LUN.

-drivetype

Displays the drive type of the LUN which is essentially the drive type of the storage pool. If more than one type of drive are present in the pool, then Mixed will be displayed.

-offset

Displays the alignment offset of the LUN that was assigned when the LUN was bound.

-opDetails

Displays the details of the currently running operation. The values are name, state, status, and percent completed. If no current operation is running, then the values for these fields are N/A, N/A, N/A, and 0, respectively. This could be used to show compression and auto-tiering related information.

-owner

Displays the name of the SP that currently owns the LUN. If neither SP owns the LUN a value of Unknown is returned.

-isPoolLUN

Displays Yes, if it is either a thin LUN or pool LUN.

-isThinLUN

Displays Yes if it is a thin LUN.

-isCompressed

Displays the isCompressed property of the LUN.

-poolName

Displays the name of the storage pool to which the mapped LUN belongs.

-rtype

Specifies the RAID group type of the LUN.

-perfData

Specifies the following information: Statistics Logging Current Time, Read Requests, Write Requests, Blocks Read, Blocks Written, Busy Ticks, Idle Ticks, Sum of Outstanding Requests, Non-Zero Request Count Arrivals, Implicit Trespasses, and Explicit Trespasses.

-isPrivate

Specifies if the LUN is a private LUN. Pool LUNs can be private since they can be part of a reserved LUN pool.

-featureData

Returns the information about the features on the LUN.

-state

Displays the state of the mapped LUN.

-status

Displays the status of the mapped LUN. This displays a string that corresponds to the status code, along with the status code in hex in lowercase, enclosed in brackets.

-uid

Displays the unique identifier (System WWN + LUN WWN) for the LUN.

-tieringPolicy

Displays the auto-tiering policy.

-initialTier

Displays the initial tier information.

-tiers

Displays the tier information.

-all

Displays the LUN information along with the auto-tiering policy (if the auto-tiering enabler is installed), the initial tier, and the tier information.

OUTPUT

naviseccli -h 10.5.2.182 lun -list -l 0 -all

```
LOGICAL UNIT NUMBER
LOGICAL UNIT NUMBER 0
Name:  LUN 0
UID:  60:06:01:60:83:32:28:00:3A:23:E6:E2:5C:37:DF:11
Current Owner:  SP A
Default Owner:  SP A
Allocation Owner:  SP A
User Capacity (Blocks):  209715200
User Capacity (GBs):  100.000
Consumed Capacity (Blocks):  218117120
Consumed Capacity (GBs):  104.006
Pool Name:  Pool 0
Raid Type:  r_5
Disk Type:  Mixed
Offset:  0
Auto-Assign Enabled:  DISABLED
Auto-Trespass Enabled:  DISABLED
Current State:  Ready
Status:  OK(0x0)
Is Faulted:  false
Is Transitioning:  false
Current Operation:  None
Current Operation State:  N/A
Current Operation Status:  N/A
Current Operation Percent Completed:  0
Statistics Logging Current Time:  04/06/10 08:07:09
Read Requests:  0
Read Requests SP A:  0
Read Requests SP B:  0
Write Requests:  0
Write Requests SP A:  0
Write Requests SP B:  0
Blocks Read:  0
Blocks Read SP A:  0
Blocks Read SP B:  0
Blocks Written:  0
Blocks Written SP A:  0
Blocks Written SP B:  0
Busy Ticks:  0
Busy Ticks SP A:  0
Busy Ticks SP B:  0
Idle Ticks:  0
Idle Ticks SP A:  0
Idle Ticks SP B:  0
Sum of Outstanding Requests:  0
Sum of Outstanding Requests SP A:  0
Sum of Outstanding Requests SP B:  0
Non-Zero Request Count Arrivals:  0
Non-Zero Request Count Arrivals SP A:  0
Non-Zero Request Count Arrivals SP B:  0
Implicit Trespasses:  0
Implicit Trespasses SP A:  0
Implicit Trespasses SP B:  0
Explicit Trespasses:  0
Explicit Trespasses SP A:  0
Explicit Trespasses SP B:  0
Is Pool LUN:  Yes
Is Thin LUN:  No
Is Private:  No
Is Compressed:  No
Features:  N/A
Tiering Policy:  Lowest Available
```

```
Initial Tier:  Lowest Available
Tier Distribution:
FC:  100.00%
```

4

Auto-tiering Commands

This chapter provides a brief overview on the auto-tiering feature and includes a list of commands that you can use if the feature is enabled on your system.

Major topics include:

About tiered storage

Tiered storage is the assignment of different categories of data to different types of storage media to reduce the total storage cost. Data categories may be based on the levels of protection needed, performance requirements, frequency of use, cost, and other considerations. The purpose of tiered storage is to retain the most frequently accessed or important data on fast, high performance (more expensive) drives, and move the less frequently accessed and less important data to low performance (less expensive) drives. The software provides two types of tiered storage:

- Inital tier placement (does not require the auto-tiering enabler)
- Auto-tiering placement (requires the auto-tiering enabler)

Initial tier placement (auto-tiering enabler is not installed)

For initial tier placement, you must manually specify the storage tier to place the LUN data. The tier choices are **Optimize for Pool Performance**, **Highest Available Tier**, and **Lowest Available Tier**. Select the tier based on the relative performance requirements for the LUN data. After you assign a LUN to a specific tier, you must perform a LUN migration to relocate the data to a different tier or install the auto-tiering enabler.

Initial tier placement	Description
Optimize for Pool Performance	No tier preference is specified. The system uses the default data placement algorithm to place the data.
Highest Available Tier	Sets the preferred tier for inital data placement to the highest available tier.
Lowest Available Tier	Sets the preferred tier for inital data placement to the lowest available tier.

Auto-tiering placement (auto-tiering enabler is installed)

The auto-tiering feature migrates data between storage tiers to lower the customer's total cost of ownership (TCO). Storage pools are configured with multiple classes of storage devices (EFD, FC, and SATA) and system software continually tracks the usage of the data stored on the LUNs. Using these LUN statistics, the auto-tiering feature relocates data blocks (slices) of each LUN to the storage tier that is best suited for that data.

Auto-tiering placement	Description
Auto Tier	The system uses the LUN performance statistics for data relocation.
Highest Available Tier	Sets the preferred tier for data relocation to the highest available tier.
Lowest Available Tier	Sets the preferred tier for data relocation to the lowest available tier.
No Data Movement	No data relocation between tiers. The initial tier placement is retained.

If you install the auto-tiering enabler on a system with initial tier placement settings, the system bases the auto-tier settings on the initial tier settings.

Initial tier placement	Auto-tiering placement
Optimize for Pool Performance	Auto Tier
Highest Available Tier	Highest Available Tier
Lowest Available Tier	Lowest Available Tier
None	No Data Movement

naviseccli auto-tiering commands

Command	Description
autotiering -schedule -modify	Modifies the schedule.
autotiering -schedule -enable|-disable	Enables or disables the default schedule.
autotiering -relocation -start	Starts a relocation.
autotiering -relocation -setrate	Sets the relocation rate.
autotiering -relocation -pause|-resume	Pauses or resumes relocations at the system level.
autotiering -relocation -stop	Stops a relocation.
autotiering -info	Displays the auto-tiering information.

autotiering -schedule -modify

Modifies the schedule.

PREREQUISITES

You must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **autotiering -schedule -modify** command changes a scheduled day, start time, and duration. When modifying the schedule, the confirmation message contains the scheduled stop time. The stop time is calculated on the system by using the client's GMT offset, the scheduled start time, and scheduled duration.

SYNTAX

```
autotiering -schedule -modify [-day sun|mon|tue|wed|thu|fri|sat]
[-starttime hh:mm]
[-duration hh:mm]
[-o]
```

OPTIONS

-day sun|mon|tue|wed|thu|fri|sat

Specified as a space separated list containing one or more of the following abbreviations: Sun, Mon, Tue, Wed, Thu, Fri, or Sat.

-starttime *hh:mm*

Specifies the scheduled start time. The hours are specified from 0-23 and the minutes are specified from 00-59. The start time is set relevant to the client's GMT offset.

-duration *hh:mm*

Specifies the scheduled duration. The maximum duration is 23 hours and 59 minutes. The minimum duration is 1 minute.

EXAMPLE

```
autotiering -schedule -modify -day Mon Wed Fri -starttime 10:30 -duration
2:00
```

OUTPUT

None if the command succeeds; status or error information if it fails.

autotiering -schedule -enable|-disable

Enables or disables the default schedule

PREREQUISITES

You must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **autotiering -schedule -disable** command disables the auto-tiering default schedule. The default schedule can be enabled using the **schedule -enable** command.

SYNTAX

```
autotiering -schedule -enable|-disable [-o]
```

OPTIONS

-o

Executes the command without prompting for the confirmation.

EXAMPLE # 1

```
autotiering -schedule -enable -o
```

EXAMPLE # 2

```
autotiering -schedule -disable -o
```

OUTPUT

None if the command succeeds; status or error information if it fails.

autotiering -relocation -start

Starts a relocation

PREREQUISITES

You must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **autotiering -relocation -start** command manually starts a relocation on a storage pool regardless of the auto-tiering state.

SYNTAX

```
autotiering -relocation -start -poolId poolId1 [poolId2] | -poolname pool
name] [poolname2] | -all
[-duration hh:mm]
[-rate high|medium|low]
[-o]
```

OPTIONS

-poolID *poolID*| **-poolname** *poolname*

Specifies the storage pool ID or the storage pool name on which the manual relocation starts.

-all

Starts the manual relocation on all the storage pools on the system.

-duration *hh:mm*

Specifies the duration for the manual relocation. The maximum duration is 23 hours and 59 minutes and the minimum duration is 1 minute. The default duration is 8 hours.

-rate high|medium|low

Specifies the rate for a manual relocation. The valid values are high, medium, or low. If the rate is not specified, it defaults to the system rate, that is, the value returned from the **autotiering -info -rate**.

-o

Executes the command without prompting for the confirmation.

EXAMPLE

```
autotiering -relocation -start -all -rate high -duration 10:00
```

OUTPUT

None if the command succeeds; status or error information if it fails.

autotiering -relocation -setrate

Sets the relocation rate

PREREQUISITES

You must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **autotiering -relocation -setrate** command sets the relocation rate that determines how the scheduled relocations will be performed on the system. If the rate is not specified when starting a manual relocation, it will use this rate.

SYNTAX

```
autotiering -relocation -setrate -rate high|medium|low
[-o]
```

OPTIONS

-rate high|medium|low

Sets the scheduled relocation rate. The valid values are high, medium, or low.

-o

Executes the command without prompting for the confirmation.

EXAMPLE

```
autotiering -relocation -setrate -rate low -o
```

OUTPUT

None if the command succeeds; status or error information if it fails.

autotiering -relocation -pause|-resume

Pauses or resumes relocations at the system level

PREREQUISITES

You must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **autotiering -relocation -pause** command pauses all the active relocation tasks on the system. It also prevents running new relocations (manual and scheduled) by immediately placing the tasks in the paused state.

The **autotiering -relocation -resume** command allows relocation tasks in the paused state to continue and allows new relocations (manual and scheduled) to start immediately.

SYNTAX

```
autotiering -relocation -pause|-resume [-o]
```

OPTIONS

-o

Executes the command without prompting for the confirmation.

EXAMPLE # 1

```
autotiering -relocation -pause -o
```

EXAMPLE # 2

```
autotiering -relocation -resume
```

OUTPUT

None if the command succeeds; status or error information if it fails.

autotiering -relocation -stop

Stops a relocation

PREREQUISITES

You must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **autotiering -relocation -stop** command stops a relocation that was started manually or by the scheduler.

SYNTAX

```
autoTiering -relocation -stop -poolId poolID1 [poolID2]|-poolname pool name1
[pool name2]|-all
[-o]
```

OPTIONS

-poolId *poolid*|**-poolname** *poolname*

Specifies the storage pool ID or the storage pool name on which the manual relocation stops.

-all

Stops the manual relocation on all the storage pools on the system.

-o

Executes the command without prompting for the confirmation.

EXAMPLE

```
autotiering -relocation -stop -all
```

OUTPUT

None if the command succeeds; status or error information if it fails.

autotiering -info

Displays the auto-tiering information

PREREQUISITES

You must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **autotiering -info** command displays the auto-tiering state, schedules, relocation rate, and operation status. You can view the auto-tiering history using the getlog command.

SYNTAX

```
autotiering -info [-state]
[-schedule]
[-rate]
[-opstatus [-poolId-poolId1[-poolId 2...]|
-poolName -poolName1[-poolName2...]]]
```

OPTIONS

-state

Displays the auto-tiering state.

-schedule

Displays the auto-tiering schedule.

-rate

Displays the auto-tiering relocation rate.

-opstatus

Displays the auto-tiering operations status for all the storage pools on the system or for a given list of storage pools. If a relocation is not in progress for a storage pool, the status of the most recent relocation will be displayed.

OUTPUT

naviseccli –h 10.5.2.182 autotiering -info -opstatus

```
Storage Pool Name:  Pool 11
Storage Pool ID:  11
Relocation Start Time:  09/10/09 22:00
Relocation Stop Time:  09/11/09 2:00
Relocation Status:  Active
Relocation Type:  Scheduled
Relocation Rate:  Medium
Data to Move Up (GBs):  0
Data to Move Down (GBs):  0
Data Movement Completed (GBs):  12
Estimated Time to Complete:  N/A
Schedule Duration Remaining: 1 hr, 15 min

Storage Pool Name :  Pool 37
Storage Pool ID:  37
Relocation Start Time:  09/10/09 22:00
Relocation Stop Time:  09/11/09 2:00
Relocation Status:  Active
Relocation Type:  Scheduled
Relocation Rate:  Medium
Data to Move Up (GBs):  9
Data to Move Down (GBs):  0
Data Movement Completed (GBs):  3
Estimated Time to Complete:  45 min
Schedule Duration Remaining: 1 hr, 15 min

Storage Pool Name:  Pool 44
Storage Pool ID:  44
Relocation Start Time:  09/10/09 18:00
Relocation Stop Time:  09/10/09 20:00
Relocation Status:  Inactive
Relocation Type:  Manual
Relocation Rate:  Low
Data to Move Up (GBs):  44
Data to Move Down (GBs): 16
Data Movement Completed (GBs):  30
Estimated Time to Complete:  1 hr, 7 min
Schedule Duration Remaining: None
```

5

Compression Commands

This chapter provides a brief overview of the compression feature and includes a list of compression commands that you can use if this feature is enabled on your system.

Major topics include:

About LUN Compression

Compression is an optional software feature that lets you compress all types of LUN data thereby freeing up storage space in your systems. Data compression analyzes the data on a disk and applies algorithms that reduce the size of repetitive sequences of bits that are inherent in some types of files. The amount of reduction resulting from compression is dependent on the mix of data types being stored; however, unlike de-duplication, compression does not depend on the presence of multiple copies of the same data.

All compression operations perform in the background while continuing to service host I/O. In order to use the compression feature, you must install the compression enabler and the thin provisioning enabler on the system. You can compress RAID group LUNs as well as pool LUNs. All compressed LUNs are thin LUNs.

During the compression operation for a RAID group LUN, the software migrates and compresses the LUN data to a thin LUN in a pool. The LUN becomes a compressed thin LUN while migrating the software. During the migration phase, the software detects the zeros on the source LUN and deallocates them on the target LUN which frees up more storage capacity on the target LUN. For better performance and improved space utilization, we strongly recommend that the target LUN is a newly created LUN with no existing data.

Compression operations for pool LUNs (thick and thin) take place within the pool in which the LUN being compressed resides. When compressed, thick and thin LUNs become compressed thin LUNs.

If, for some reason, you need to decompress the compressed data or temporarily pause any active compression operations, the software lets you do both. When decompressed, RAID group LUNs become fully-provisioned thin LUNs with the same capacity as the original RAID group LUN and thick LUNs become fully-provisioned thin LUNs. In addition, the software lets you easily monitor the status of all LUN compression operations.

Table 12. naviseccli compression commands

Command	Description
compression -on	Turns on compression on a LUN.
compression -pause	Pauses compression on a LUN.
compression -pauseall	Pauses compression on the system.
compression -resume	Resumes compression on a LUN.
compression -resumeall	Resumes compression on the system.
compression -modify	Modifies the compression rate.
compression -off	Turns off compression.
compression -list	Lists compression information.

compression -on

Turns on compression on a LUN

PREREQUISITES

You must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **naviseccli compression -on** command turns on the compression for pool LUN and traditional LUN. The command syntax differs depending on the LUN, either a pool LUN or traditional LUN.

SYNTAX

For Pool LUN: **naviseccli –h sp compression –on -l** *LUN number* [**-rate low**|**meduim**|**high**|*value*]

For traditional LUN: **naviseccli –h sp compression –on -l** *LUN number* **-dest poolid** *storagepoolid* | **-destpoolname** *storagepoolname* [**-rate low**|**medium**|**high**|*value*]

OPTIONS

-l *LUN number*

Specifies the LUN number to be compressed.

-destpoolid *storagepoolid*

Specifies the destination pool ID to which the traditional LUN gets migrated. This option is valid only when the LUN being compressed is a traditional LUN.

-destpoolname *storagepoolname*

Specifies the destination pool name to which the traditional LUN gets migrated. This option is valid only when the LUN being compressed is a traditional LUN.

-rate low|**medium**|**high**|*value*

Specifies the compression rate. The default compression rate is medium. The valid compression rates are low or 1, medium or 2, and high or 3.

EXAMPLE

```
naviseccli compression -on -l 10 –destpoolid 0 –rate low
```

OUTPUT

None if the command succeeds; status or error information if it fails.

compression -pause

Pauses compression on a LUN

PREREQUISITES

You must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **naviseccli compression -pause** command pauses compression on a LUN.

SYNTAX

naviseccli –h sp compression –pause -l *LUN number*

OPTIONS

-l *LUN number*

Specifies the LUN number of the compressed LUN to be paused.

EXAMPLE

```
naviseccli compression -pause -l 10
```

OUTPUT

None if the command succeeds; status or error information if it fails.

compression -feature -pause

Pauses compression on the system

PREREQUISITES

You must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **naviseccli compression -feature -pause** command pauses compression on the system.

SYNTAX

```
naviseccli –h sp compression –feature -pause [-o]
```

OPTIONS

-o

Executes the command without prompting for confirmation.

EXAMPLE

```
naviseccli compression -feature -pause
```

OUTPUT

None if the command succeeds; status or error information if it fails.

compression -resume

Resumes compression on a LUN

PREREQUISITES

You must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **naviseccli compression -resume** command resumes paused compression on a LUN. The command can also work for overriding compression in decompression system paused state.

SYNTAX

compression -resume -l *LUN number* [**-o**]

OPTIONS

-l *LUN number*

Specifies the LUN number of the paused compressed LUN to resume.

-o

Executes the command without prompting for confirmation.

EXAMPLE

```
naviseccli compression -resume -l 10
```

OUTPUT

None if the command succeeds; status or error information if it fails.

compression -feature -resume

Resumes compression on the system

PREREQUISITES

You must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **naviseccli compression -feature -resume** command resumes compression on the system.

SYNTAX

```
naviseccli –h sp compression –feature -resume [-o]
```

OPTIONS

[-o]

Executes the command without prompting for confirmation.

EXAMPLE

```
naviseccli compression -feature -resume
```

OUTPUT

None if the command succeeds; status or error information if it fails.

compression -feature -info

Displays the compression feature information

PREREQUISITES

You must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **naviseccli compression -feature -info** command displays the compression feature information.

SYNTAX

```
naviseccli -h sp compression -feature -info
```

EXAMPLE

```
naviseccli compression -feature -info
```

OUTPUT

Compression Feature State: Paused

compression -modify

Modifies the compression rate

PREREQUISITES

You must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **naviseccli compression -modify** command changes the compression rate on a specified LUN.

SYNTAX

naviseccli –h sp compression –modify -l *LUN number* **-rate low**|**medium**|**high**|*value*

OPTIONS

-l *LUN number*

Specifies the LUN number of the compressed LUN to be modified.

-rate low|**medium**|**high**|*value*

Specifies the compression rate. The valid compression rates are low or 1, medium or 2, and high or 3.

EXAMPLE

```
naviseccli compression -modify -l 10 –rate low
```

OUTPUT

None if the command succeeds; status or error information if it fails.

compression -off

Turns off compression

PREREQUISITES

You must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **naviseccli compression -off** command turns off compression on a LUN.

SYNTAX

naviseccli -h sp compression -off -l *LUN number* [**-o**]

OPTIONS

-l *LUN number*

Specifies the LUN number of the LUN on which you want to stop compression.

-o

Executes the command without prompting for confirmation.

EXAMPLE

```
naviseccli compression -off -l 10
```

OUTPUT

None if the command succeeds; status or error information if it fails.

compression -list

Lists compression information

PREREQUISITES

You must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **naviseccli compression -list** command lists compression information on a specified LUN or all LUNs.

SYNTAX

```
naviseccli –h sp compression –list [-l LUN number]
[-destpoolid]
[-uid]
[-state]
[-status]
[-percentcomplete]
[-rate]
[-totalcapacity]
[-consumedcapacity]
```

OPTIONS

-l *LUN number*

Lists the information about the specified compressed LUN number. If you do not specify the LUN number, all compressed LUNs will be listed.

-destpoolid

Specifies the destination pool ID of the compressed LUN in migrating state. This option is valid only when the compression is in a migrating state.

-uid

Specifies the UID of the compressed LUN.

-state

Specifies the compression state of the LUN.

-status

Specifies the compression status.

-percentcomplete

Specifies the percentage completed.

-rate

Specifies the rate of compression.

-totalcapacity

Specifies the total capacity of the LUN.

-consumedcapacity

Specifies the consumed capacity of the LUN.

EXAMPLE

```
naviseccli compression –list
```

OUTPUT

```
LOGICAL UNIT NUMBER 31
Name:  Thin LUN 31
UID:  60:06:01:60:5A:E0:21:00:BA:45:01:A3:68:4F:DE:11
Destination Pool ID:  3
Current State:  Migrating
Status:  OK(0x0)
Rate:  High
Percent Complete:  25
Total Capacity (Blocks):  1234567
Total Capacity (GBs):  10.000
Consumed Capacity (Blocks):  1234567
Consumed Capacity (GBs):  3.500
```

6

FAST Cache Commands

This chapter provides a brief overview of the EMC FAST Cache feature and includes a list of FAST Cache commands that you can use, if the feature is enabled on your system.

Major topics include:

Introduction to caching

Caching temporarily stores frequently accessed data in the storage processors DRAM memory (SP cache) or in FAST Cache. SP Cache operates at the finest granularity 2k to 16K and has the fastest access times but is limited in size. FAST Cache provides a large secondary cache area with a 64K track size that can be configured in much larger capacities. FAST Cache uses its understanding of LUN mappings to avoid caching data that is already resident on SSD storage.

SP cache

Two types of caching that use the SP cache are available: read caching and write caching. Each type has its own SP memory. All LUNs can use read or write caching or both. All LUNs with read caching enabled share the read cache of the SP that owns them, and all LUNs with write caching enabled share the write cache of the SP that owns them. Each SP has a write cache in its memory, which mirrors the write cache on the other SP. Since these caches mirror each other, they are always either enabled or disabled and are always the same size.

To use read or write caching, you must set up read or write caching for the system and the LUNs that will use caching. Setting up read or write caching for a system requires that you assign SP memory to the cache and set the system cache properties. You can set up read or write caching for a LUN when you create it or after it is bound. Setting up read or write caching for a LUN requires that you set the LUN cache properties.

FAST Cache

Note: Only systems running FLARE version 4.30 or later with unbound SSD disks and the FAST Cache enabler installed support the FAST Cache.

FAST Cache is a private Storage Pool consisting of two or more SSD disks that is owned by the Storage Processors. FAST Cache supports Read and Write Caching and is controlled by the SP Cache. FAST Cache can be enabled for all the LUNs in a Storage Pool or individual LUNS in RAID Groups.

Note: When FAST Cache is used, EMC recommends that RAID group LUNs have read/write caching enabled.

You can enable FAST Cache for a LUN in a RAID group of SSDs. If this LUN is in a RAID group, it can use FAST Cache if it is enabled for the LUN. If this LUN is in a pool, it always uses FAST Cache if FAST Cache is enabled for the pool. To use FAST Cache, the system must have:

- FAST Cache enabler installed
- FAST Cache configured

- FAST Cache use enabled at the RAID Group LUN and / or Storage Pool

Read and write caching recommendations

Read and write caching recommendations for different LUN types in a RAID group are:

RAID group LUN type	Recommendations
RAID 6	Highly recommended
RAID 5	Highly recommended
RAID 3	Recommended
RAID 1	Recommended
RAID 1/0	Recommended
RAID 0	Recommended
Individual Unit	Recommended
Hot spare	Not Allowed

Read and write caching recommendations for different pool types are:

Pool type	Recommendations
RAID 6	Highly recommended
RAID 5	Highly recommended
RAID 1/0[a]	Recommended
Hot spare	Not Allowed

naviseccli FAST Cache commands

Command	Description
`cache -fast -create`	Creates FAST Cache.
`cache -fast -destroy`	Destroys FAST Cache.
`cache -fast -info`	Displays FAST Cache information.

[a] RAID 1/0 pools are supported for systems running FLARE version 04.30 or later software.

cache -fast -create

Creates FAST Cache

PREREQUISITES

You must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **naviseccli cache -fast -create** command creates the FAST Cache.

SYNTAX

```
cache -fast -create -disks disksList [-rtype raidtype]
[-mode rw]
[-o]
```

OPTIONS

-disks *disksList*

Specifies the name of the disks used as FAST Cache. If you do not specify the disks, the command will fail.

-mode |rw

Specifies the cache mode. The **rw** is readwrite mode.

-rtype *raidtype*

Specifies the RAID types. Valid RAID types are disk and r_1.

-o

Executes the command without prompting for confirmation.

EXAMPLE

```
naviseccli cache -fast -create -disks 0_0_6  0_0_7 -mode rw -rtype r_1
```

OUTPUT

```
The system will reenable SP Cache when it finishes configuring FAST Cache.
 This process may take up to several hours during which the system may
disable SP Cache. Do you want to continue? (y/n) Y
```

cache -fast -destroy

Destroys FAST Cache

PREREQUISITES

You must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **naviseccli cache -fast -destroy** command destroys the FAST Cache.

SYNTAX

cache -fast -destroy [**-o**]

OPTIONS

-o

Executes the command without prompting for confirmation.

EXAMPLE

```
naviseccli cache -fast -destroy
```

OUTPUT

```
To destroy FAST Cache, the System must flush all data to disk. This operation
 may be time consuming and may
impact system performance. You can monitor the progress of this operation
by using the following command: cache -fast -info.
Do you want to continue? (y/n) Y
```

cache -fast -info

Displays FAST Cache properties

PREREQUISITES

You must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **naviseccli cache -fast -info** command lets you view the FAST Cache properties.

SYNTAX

```
cache -fast -info [-disks]
[-status]
[-perfData]
```

OPTIONS

-disks

Displays the disks used for FAST Cache.

-status

Displays FAST Cache status.

-perfData

Displays FAST Cache statistics.

-o

Executes the command without prompting for confirmation.

EXAMPLE

```
naviseccli cache -fast -info
```

OUTPUT

```
Disks:
Bus 0 Enclosure 0 Disk 6
Bus 0 Enclosure 0 Disk 7
Mode:  Read/Write
Raid Type:  r_1
Size (GB):  64
State:  Enabled
Current Operation:  Initializing
Current Operation Status:  Running
Current Operation Percent Completed: 20%
Percentage Dirty SPA:  1
MBs Flushed SPA: 50
Percentage Dirty SPB: 2
MBs Flushed SPB: 80
```

7

EMC Unisphere QoS Manager

This chapter introduces the EMC® Unisphere™ Quality of Service (QoS) Manager application, associated dependencies, and the online help system. Users of previous versions of EMC CLARiiON® software should note that EMC Navisphere® Quality of Service Manager has been changed to Unisphere QoS Manager. This software, with the exception of new features, remains entirely identical in function. The Navisphere Quality of Service Manager CLI commands and syntax have been preserved and can be used on systems that are running Navisphere Manager or Unisphere within the limits of interoperability expressed in the release notes.

Major topics are:

About Unisphere Quality of Service Manager

QoS Manager lets you allocate system performance resources on an application-by-application basis. You can use QoS Manager to solve performance conflicts in environments where multiple applications share the same system. Within system capacity, QoS Manager lets you meet specific performance targets for applications, and create performance thresholds to prevent applications from monopolizing system performance.

Note: QoS Manager lets you centrally manage system resources with no host footprint (no host management or software installs are required on the host).

With QoS Manager, you create user-defined I/O classes that characterize, for example, a particular application in order to monitor and control the performance of the I/O class. You must specify various I/O characteristics of your applications to define your I/O classes. You can then determine goals for your I/O classes, and define how to achieve those goals with control methods. You create one or more policies by selecting I/O classes, goals and control methods.

Note: QoS Manager is system specific. Therefore, you must enable QoS Manager on each system for which you want to use QoS Manager. You do not need to reboot your system to enable QoS Manager.

QoS Manager prerequisites

QoS Manager requires the following:

- QoS Manager must be enabled on each system on which you want to use it.

  Note: Your system must be running the required EMC FLARE® Operating Environment (OE) revision to run QoS Manager. QoS Manager is automatically installed with the required FLARE OE revision. You must enable QoS Manager on the system. For required FLARE OE revisions, see the release notes supplied with the software.

  You do not need to reboot your system to enable QoS Manager.

- The correct version of the Java Runtime Environment (JRE) (see the release notes) must be installed on the client from which you run the browser.

For system support and the latest requirements, see the release notes supplied with the software.

QoS Manager CLI commands

This section explains the **naviseccli** command and the CLI commands for QoS Manager application.

Note: The commands in this section function only with a system that has the optional QoS Manager software installed.

nqm -getlatestperf

Displays the latest performance information for a running or measuring policy.

PREREQUISITES

You must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **nqm -getlatestperf** command lets you view the latest performance information for a running or measuring policy.

SYNTAX

nqm -getlatestperf [**-ioclasses** *classnames*] [**-value bw**|**tt**|**rt**]

OPTIONS

-ioclasses *classnames*

Specifies an I/O class name. If not specified, all of the I/O classes in the currently running policy will be listed. If the I/O class specified is not a part of a currently running policy, an error message appears.

-value bw | **tt** | **rt**

Lists the performance counters output. The following are the valid counter types:

bw: Bandwidth (MB/s)

tt: Throughput (I/O/s)

rt: Response time (ms)

EXAMPLE

For **ss1_spa**, this command displays the latest performance information.

```
naviseccli -h ss1_spa nqm -getlatestperf
```

OUTPUT

```
Class Name:OLTP class
Local Time:Sun June 19 09:10:00 2005
Response Time[ms]:20
Throughput[I/O/sec]:1000
Bandwidth[MB/s]:500
```

```
Class Name:Background class
Local Time: Sun June 19 09:10:00 2005
Response Time[ms]:28
Throughput[I/O/sec]:800
Bandwidth[MB/s]:300
```

nqm -info

Provides information about QoS Manager on the system.

PREREQUISITES

You must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **nqm -info** command provides you with information about QoS Manager on the system.

SYNTAX

```
nqm -info
```

EXAMPLE

For **ss1_spa**, this command displays information about QoS Manager on the system.

```
naviseccli -h ss1_spa nqm -info
```

OUTPUT

```
Current State of NQM: Running
Goal Satisfied: N/A
NQM Provider Version: 6.24
Total User Defined Classes: 2
Total User Defined Policies: 2
Log Event On: Goal no longer satisfied
Fallback Policy:aPolicy
Current Policy: aRunningPolicy
Current Localized Array Time: 22:12:33 10/2/2005
```

nqm -ioclass -create

Creates a new I/O class.

PREREQUISITES

You must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **nqm -ioclass** command with the **-create** switch creates a new I/O class. The maximum number of user-defined classes is 32.

SYNTAX

```
nqm -ioclass –create -ctrlmethod limit -gmetric bw|tt|rt -gval value
|-ctrlmethod cruise -gtol value
|-ctrlmethod fixed | -noctrl –name classname
[-snapshots name|WWN | -luns number|WWN | -nolun] -iotype r|w|rw
[[-minsize value_in_kb] [-maxsize value_in_kb]] | [-anyio][-o]
```

OPTIONS

-ctrlmethod limit

Limits maximum throughput, maximum bandwidth, or minimum response time.

-gmetric bw|tt|rt

Specifies the metric type. It is not valid if the goal type is fixed. Options are:

bw: Bandwidth (MB/s)

tt: Throughput (I/O/s)

rt: Response time (ms)

-gval *value*

Specifies the goal value for this class. If the control method is fixed, this value must be between 1 and 512. Otherwise, it must be greater than 0 and less than 10,000,000,000.

-ctrlmethod cruise

Gives the specific value of throughput, bandwidth, or response time.

-gtol *value*

Specifies the tolerance ratio for goal settings. It must be a value between 0 and 100. Unit is percent (%). It is used only for a cruise goal type.

-ctrlmethod fixed

Sets a fixed queue depth for an I/O class.

-noctrl

If specified, creates the I/O class without any control method.

-name *classname*

Specifies a new class name.

-snapshots *name|WWN*

Lists the snapshot names or the snapshot WWNs.

-luns *number|WWN*

Lists the LUN numbers or the LUN WWNs. You can use this option for FLARE LUNs, metaLUNs, thin LUNs, and fully provisioned LUNs.

-nolun

Specifies that the I/O class will not be modified to any specific LUN.

-iotype r|w|rw

Lists the I/O type. Valid inputs are r (read) or w (write) or rw (readwrite).

-minsize *value_in_kb*

Indicates the minimum I/O size in KBs, a value between .5 and 64 in increments of .5.

-maxsize *value_in_kb*

Indicates the maximum I/O size in KBs.

-anyio

Indicates the I/O class range, if any. If no I/O size range is specified, the default setting will be anyio.

-o

Creates an I/O class without prompting for warning/confirmation. If you do not specify the **-o** switch, the following confirmation message appears:

```
You chose Fixed Queue Depth as your control method. Please be aware
that this feature is for EXPERT users ONLY. Running NQM with this
control method may prevent you from fully utilizing your system's
performance resources by restricting your I/O classes to a certain
queue depth on the array. Please use with caution.
Do you want to continue it (y/n)?
```

EXAMPLE

For **ss1_spa**, this command creates an I/O class with the name **testClass** including LUNs 1, 2, 3 with an I/O type of read. The I/O range is 32–64 KB. The throughput has a goal value of 500 I/Os per second and a tolerance ratio of 10%.

```
naviseccli -h ss1_spa nqm -ioclass -create -name testClass
  -luns 1 2 3 -iotype r -minsize 32 -maxsize 64 -ctrlmethod cruise -gmetric
 tt -gval 500 -gtol 10
```

OUTPUT

None

nqm -ioclass -destroy

Removes an existing I/O class.

PREREQUISITES

You must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **nqm -ioclass** command with the **-destroy** switch removes an existing I/O class.

Note: The operation is not allowed while the class is in a running state.

SYNTAX

nqm -ioclass -destroy -name *classname* [**-o**]

OPTIONS

-name *classname*

Specifies an existing class name.

-o

Destroys an I/O class without prompting for warning/confirmation. If you do not specify the **-o** switch when destroying an I/O class, a confirmation message appears.

y = Destroy an I/O class.

n = Do not destroy an I/O class.

EXAMPLE

For **ss1_spa**, testClass will be removed.

```
naviseccli -h ss1_spa nqm -ioclass -destroy -name testClass
```

OUTPUT

None

nqm -ioclass -list

Lists all application classes previously created.

PREREQUISITES

You must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **nqm -ioclass** command with the **-list** switch displays all previously created application classes.

SYNTAX

```
nqm -ioclass -list [-ctrlmethod]
[-iorange]
[-iotype]
[-luns]
[-name [ioclassname]]
[-snapshots]
[-status]
[-state]
```

OPTIONS

-ctrlmethod

Displays the control method and one or more of the following parameters. For the cruise control method, it displays the goal metric, goal value, and tolerance. For the limit method, it displays the goal metric and goal value. For the fixed-queue-depth method, it displays only the queue depth value.

-iorange

Lists the range of I/O sizes in this class.

-iotype

Lists the I/O type. They are read, write, or readwrite.

-luns

Lists the LUNs contained in the class. For each FLARE LUN, thin LUN, and fully provisioned LUN, the LUN number, name, WWN, and RAID type are displayed. For metaLUNs, the RAID type is displayed as N/A. For the class that does not contain any LUNs, the LUNs are listed as *Not LUN Specific*.

-name [*ioclassname*]

Specifies an I/O class name and lists all information for that I/O class. If you do not specify this option, all I/O class names are displayed.

-snapshots

Lists the snapshots contained in the class. For each snapshot, the snapshot's name, the WWN, and the target logical unit are displayed.

-status

Displays the current status of an I/O class, which may be one of the following:

Ready: The I/O class is ready to be run within the context of a policy.

Warning: The I/O class does not have a goal and can only be measured in the context of a policy.

Broken: The I/O class does not include any LUNs because its last LUN, which could be a traditional LUN, a metaLUN, or a thin LUN, was destroyed. If the last LUN is a thin LUN and it goes offline, the I/O class (or any policies that contain this I/O class) is displayed as Broken.

-state

Displays the class operational state, which may be one of the following:

Running: QoS Manager actively controls the system's I/O flow and collects performance information.

Idle: QoS Manager is not controlling or measuring I/O.

Measuring: QoS Manager collects performance, but does not tune it.

EXAMPLE

For **ss1_spa**, this command displays all previously created application classes.

```
naviseccli -h ss1_spa nqm -ioclass -list
```

OUTPUT

```
Name: TestClassWithNOGoal
Status: Ready
Current State: Idle
Number of LUNs: 3
LUNs:
LUN Number: 0
LUN Name: LUN 0
LUN WWN: 60:06:01:60:4E:22:0E:00:4C:CC:D6:F8:67:6C:D8:11
RAID Type: RAID5
LUN Number: 2
LUN Name: LUN 2
```

```
LUN WWN: 60:06:01:60:4E:22:0E:00:4E:CC:D6:F8:67:6C:D8:11
RAID Type: RAID5
LUN Number: 1
LUN Name: LUN 1
LUN WWN: 60:06:01:60:4E:22:0E:00:4D:CC:D6:F8:67:6C:D8:11
RAID Type: RAID5
Snapshot(s):
Snapshot Name: Snap7
Snapshot WWN: 60:06:01:60:4B:50:1D:00:B4:21:88:CF:39:E6:DD:11
Target Logical Unit: 8170
IO Type: ReadWrite
IO Size Range: Any
Control Method: Limit
Goal Metric: Throughput
Goal Value: 400 IO/s
Name: TestCompleteClass
Status: Ready
Current State: Idle
Number of LUNs: 3
LUNs:
LUN Number: 0
LUN Name: LUN 0
LUN WWN: 60:06:01:60:4E:22:0E:00:4C:CC:D6:F8:67:6C:D8:11
RAID Type: RAID5
LUN Number: 2
LUN Name: LUN 2
LUN WWN: 60:06:01:60:4E:22:0E:00:4E:CC:D6:F8:67:6C:D8:11
RAID Type: RAID5
LUN Number: 1
LUN Name: LUN 1
LUN WWN: 60:06:01:60:4E:22:0E:00:4D:CC:D6:F8:67:6C:D8:11
RAID Type: RAID5
IO Type: ReadWrite
IO Size Range: 12KB -- 32KB
Control Method: Cruise Control
Goal Metric: Throughput
Goal Value: 400 IO/s
Goal Tolerance[%]: 50
```

nqm -ioclass -modify

Modifies an existing I/O class.

PREREQUISITES

You must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **nqm -ioclass** command with the **-modify** switch modifies an existing I/O class. You can use this command to rename the class, change the properties of a class, or update the contained target lists.

Note: This operation is not allowed while the class is in a running state.

SYNTAX

```
nqm -ioclass -modify -name classname
[-anyio]
[-iotype r|w|rw]
[-snapshots name|WWN | -luns number|WWN | -nolun]
[[-maxsize value_in_kb][-minsize value_in_kb]]
[-newname newname]
[goal switches]
[-o]
[-ctrlmethod limit -gmetric bw|tt|rt -gval value |-ctrlmethod cruise
-gmetric bw|tt|rt -gval value -gtol value |-ctrlmethod fixed -gval value|
-noctrl]
```

OPTIONS

-name *classname*

Specifies an existing class name.

Note: **-anyio** and **-maxsize**/**-minsize** are exclusive options.

-anyio

Indicates the range of any I/O class.

-iotype r|w|rw

Lists the I/O type. Valid inputs are r (read) or w (write) or rw (readwrite).

-snapshots *name|WWN*

Lists the snapshot names or the snapshot WWNs.

-luns *number|WWN*

Lists LUN numbers or LUN WWNs. You can use this option for FLARE LUNs, metaLUNs, thin LUNs, and fully provisioned LUNs.

-nolun

Specifies that the I/O class will not be modified to any specific LUN.

-maxsize *value_in_kb*

Indicates the maximum I/O size in KBs.

-minsize *value_in_kb*

Indicates the minimum I/O size in KBs, a value between .5 and 64 in increments of .5.

-newname *newname*

Indicates a new I/O class name.

-o

Modifies an I/O class without prompting for warning or confirmation. If the user omits this option when modifying an I/O class, a confirmation message appears:

```
The I/O class is contained by a scheduled policy. Do you want to
modify it (y/n)?
```

-ctrlmethod limit

Limits maximum throughput, maximum bandwidth, or minimum response time.

-gmetric bw|tt|rt

Specifies the metric type. It is not valid if the goal type is fixed. The following are the valid metric types:

bw: Bandwidth (MB/s)

tt: Throughput (I/O/s)

rt: Response time (ms)

-gval *value*

Specifies the goal value for this class. If the control method is fixed, this value must be between 1 and 512. Otherwise, it must be greater than 0 and less than 10,000,000,000.

-ctrlmethod cruise

Gives the specific value of throughput, bandwidth, or response time.

-gtol *value*

Specifies the tolerance ratio for goal settings. It must be a value between 0 and 100. The unit is percent (%). It is used only for a cruise goal type.

-ctrlmethod fixed

Sets a fixed queue depth for an I/O class.

-noctrl

If specified, creates the I/O class without any control method.

EXAMPLE

For **ss1_spa**, this command modifies **testClass** and gives a new I/O class name of **OLTPClass**.

```
naviseccli -h ss1_spa nqm -ioclass -modify -name testClass -newname OLTPClass
```

OUTPUT

None

nqm -measure

Starts a specified policy in measuring mode.

PREREQUISITES

You must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **nqm -measure** command starts a specified policy in measuring mode.

SYNTAX

nqm –measure *policyname*

OPTIONS

policyname

Specifies the existing policy name.

EXAMPLE

For **ss1_spa**, this command starts **testPolicy** in measuring mode.

```
naviseccli –h ss1_spa nqm –measure testPolicy
```

OUTPUT

None

nqm -off

Shuts down the QoS Manager operations.

PREREQUISITES

You must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **nqm -off** command shuts down the QoS Manager operations. Use this command to stop QoS Manager from running, suspend all scheduled tasks, and disable the fallback feature. This command does not work if QoS Manager is not active.

SYNTAX

```
nqm -off [-o]
```

OPTIONS

-o

Shuts down the QoS Manager operations without prompting for warning/confirmation. If you omit the **-o** switch, the following confirmation message appears:

```
This command will stop NQM from running, suspend all scheduled
tasks and disable fallback feature. Do you want to continue (y/n)?
```

EXAMPLE

For **10.15.17.205**, this command shuts down QoS Manager operations.

```
naviseccli -user admin -password admin -scope 0 -h 10.15.17.205  nqm -off
```

OUTPUT

None

nqm -policy -create

Creates a new policy.

PREREQUISITES

You must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **naviseccli nqm -policy** command with the **-create** switch creates a new policy. The maximum policy number allowed is 10.

SYNTAX

```
nqm -policy -create -name policyname [-evalwindow number_of_samples]
[-failaction stop|measure|continue]
[-ioclasses classnames|-noclass]
[-timelimit value_in_min]
```

OPTIONS

-name *policyname*

Specifies the policy name.

-evalwindow *number_of_samples*

Specifies the number of sample periods needed to meet (or to fail to meet) the goal in order for the goal to be classified as satisfied (or unsatisfied). This value must be between 3 and 30. The default value is 3.

-failaction stop |measure|continue

Specifies the action QoS Manager takes when the goal is not satisfied. The default action is stop.

-ioclasses *classnames*

Specifies the I/O class names.

-noclass

Creates the policy with no I/O class.

-timelimit *value_in_min*

Specifies the maximum time in minutes that a system takes to satisfy the goal. You must specify the limit in minutes. This value must be between 5 and 1440. The default value is 60.

EXAMPLE

For **ss1_spa**, this command creates a new policy for **clitestpolicy**. The specified I/O class is **testClass**. The system has 20 minutes to satisfy the goal. QoS Manager stops if the goal is not satisfied in the given time limit. The number of sample periods is **3**.

```
naviseccli -h ss1_spa nqm -policy -create -name clitestpolicy
 -ioclasses testClass -timelimit 20 -failaction stop -evalwindow 3
```

OUTPUT

None

nqm -policy -destroy

Deletes an existing policy.

PREREQUISITES

You must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **naviseccli nqm -policy** command with the **-destroy** switch deletes an existing policy that is not contained by any scheduled task. This command will not be allowed if the specified policy is running or measuring.

SYNTAX

nqm -policy -destroy -name *policyname* [**-o**]

OPTIONS

-name *policyname*

Specifies the policy name to be destroyed.

-o

Destroys the policy without prompting for warning/confirmation. If you do not specify the **-o** switch when destroying a policy, a confirmation message appears.

y = Destroy a policy.

n = Do not destroy a policy.

EXAMPLE

For **ss1_spa**, this command deletes the policy, **testPolicy**.

```
naviseccli -h ss1_spa nqm -policy -destroy -name testPolicy
```

OUTPUT

None

nqm -policy -list

Creates and manages QoS Manager policies.

PREREQUISITES

You must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **naviseccli nqm -policy** command with the **-list** switch creates and manages the QoS Manager policies.

SYNTAX

```
nqm -policy -list [-evalwindow]
[-failaction]
[-ioclasses classnames]
[-name [policyname]]
[-state]
[-status]
[-timelimit]
```

OPTIONS

-evalwindow

Specifies the number of sample periods needed to meet (or to fail to meet) the goal in order for the goal to be classified as satisfied (or unsatisfied).

-failaction

Specifies the action QoS Manager takes when it fails to satisfy the goal. If the policy contains a class with the control method of fixed queue depth, this switch option will be N/A.

-ioclasses *classnames*

Specifies the I/O class names.

-name [*policyname***]**

Specifies the policy name. If not specified, all policy names will be displayed.

-state

Displays the policy's current state.

-status

Displays the policy's current status.

-timelimit

Specifies the maximum time it should take the system to satisfy the goal. The unit is measured in minutes.

EXAMPLE

For **ss1_spa**, the command displays the created QoS Manager policies.

```
naviseccli -h ss1_spa nqm -policy -list
```

OUTPUT

```
Name: TestInCompletePolicy2
Status:Ready
Current State: Idle
Number of I/O Classes: 2
I/O Classes:
Name: TestClassWithNOGoal
Name: Background Class
Action on Failure: Stop NQM tuning after failure to converge
Time Limit:15 min
Evaluation Window: 10 samples

Name: TestCompletePolicy
Status:Ready
Current State: Idle
Number of I/O Classes: 2
I/O Classes:
Name: TestCompleteClass
Name: Background Class
Action on Failure: Stop NQM after failure to satisfy goal
Time Limit:15min
Evalution Window: 10 samples
```

nqm -policy -modify

Modifies an existing policy.

PREREQUISITES

You must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **naviseccli nqm -policy** command with the **-modify** switch modifies an existing policy.

SYNTAX

```
nqm -policy -modify -name policyname [-evalwindow number_of_samples]
[-failaction stop|measure|continue]
[-ioclasses classnames] | [-noclass]
[-newname newname]
[-o]
[-timelimit value_in_min]
```

OPTIONS

-name *policyname*

Specifies the policy name.

-evalwindow *number_of_samples*

Specifies the number of sample periods needed to meet (or to fail to meet) the goal in order for the goal to be classified as satisfied (or unsatisfied). This value must be between 3 and 30. The default value is 3.

-failaction stop |measure|continue

Specifies the action QoS Manager takes when the goal is not satisfied. The default action is stop.

-ioclasses *classnames*

Specifies the I/O class names.

-noclass

Modifies the policy to contain no I/O classes.

-newname *newname*

New name for an existing policy.

-o

Modifies a policy without prompting for warning/confirmation.

-timelimit *value_in_min*

Specifies the maximum time it should take the system to satisfy the goal. Measured in minutes, the value must be between 5 and 1440. The default value is 60.

EXAMPLE

For **ss1_spa**, this command modifies the existing policy name, **clitestpolicy2**, and assigns a new name, **OLTPPolicy**. The QoS Manager stops if the goal is not satisfied.

```
naviseccli -h ss1_spa nqm -policy -modify -name clitestpolicy2
 -newname OLTPPolicy -failaction stop
```

OUTPUT

None

nqm -run

Starts a specified policy.

PREREQUISITES

You must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **naviseccli nqm -run** command starts a specified policy.

SYNTAX

nqm -run *policyname*

OPTIONS

policyname

Specifies which policy to run.

EXAMPLE

For **ss1_spa**, this command runs **testPolicy**.

```
naviseccli -h ss1_spa nqm -run testPolicy
```

OUTPUT

None

nqm -schedule -create

Creates a scheduled task.

PREREQUISITES

You must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **naviseccli nqm -schedule** command with the **-create** switch creates a scheduled task.

SYNTAX

```
nqm -schedule -create -name schedulename -startdate mm/dd/yyyy -starttime
hh:mm:ss -duration hours:minutes -policy policyname
[-daily frequency]
| [-weekly frequency -pattern [su] [mo] [tu] [we] [th] [fr] [sa]] | -norecur
```

OPTIONS

-name *schedulename*

Specifies the scheduled task name.

-startdate *mm/dd/yyyy*

Indicates the date the task is scheduled to start.

-starttime *hh:mm:ss*

Indicates the time the task is scheduled to start.

-duration *hours:minutes*

Indicates how long the policy will run. The hours can be a value between 0 and 168. Minutes is a value between 0 and 59.

-policy *policyname*

Specifies the policy name to which the scheduled task is associated.

-daily *frequency*

Specifies that this scheduled task should occur daily at the specified frequency.

-weekly *frequency*

Specifies that this scheduled task should occur weekly at the specified frequency.

-pattern [su] [mo] [tu] [we] [th] [fr] [sa]

Specifies the list of weekdays, separated by spaces, that the task will reoccur. Specify this switch only with the **-weekly** switch.

-norecur

Specifies no recurrence of the scheduled task, if specified.

EXAMPLE

For **ss1_spa**, this command creates a daily recurring task for **TestScheduleRecurring**. The task will occur every day at 12:10:00. The duration will be 4 hours and 20 minutes, effective 4/5/2004. The scheduled task will be associated with **TestCompletePolicy**.

```
naviseccli -h ss1_spa nqm -schedule -create -name
 TestScheduleRecurring -startdate 04/05/2004 -starttime
 12:10:00 -duration 4:20 -policy TestCompletePolicy -daily 1
```

OUTPUT

None

nqm -schedule -destroy

Clears a specified scheduled task.

PREREQUISITES

You must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **naviseccli nqm -schedule** command with the **-destroy** switch clears a specified scheduled task.

SYNTAX

nqm -schedule -destroy -name *schedulename* [**-o**]

OPTIONS

-name *schedulename*

Specifies the scheduled task name.

-o

Destroys the scheduled task without prompting for warning/confirmation. If you do not specify the **-o** switch when destroying a scheduled task, a confirmation message appears.

y = Destroy a scheduled task.

n = Do not destroy the scheduled task.

EXAMPLE

For **ss1_spa**, this command clears the scheduled task **testSchedule**.

```
naviseccli -h ss1_spa nqm -schedule -destroy -name testSchedule
```

OUTPUT

None

nqm -schedule -list

Lists all scheduled tasks.

PREREQUISITES

You must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **naviseccli nqm -schedule** command with the **-list** switch lists all scheduled tasks in a timely order. If there is no task scheduled, then no task will be displayed.

SYNTAX

```
nqm -schedule -list [-name [schedulename]]
[-state]
[-start]
[-duration]
[-policy policyname]
[-recur]
```

OPTIONS

-name *schedulename*

Lists all information for a specific QoS Manager task.

-state

Specifies the state of the tasks. The different states include:

scheduled: A scheduled occurrence is waiting for its turn to run.

suspended: A suspended task is temporarily excluded and will not be run at its scheduled start time.

running: A scheduled policy is currently running.

broken: A broken task contains a broken policy that cannot be run.

-start

Displays the calendar time to start QoS Manager.

-duration

Specifies the duration the schedule runs.

-policy *policyname*

Specifies the name of the policy to be run.

-recur

Displays the recurring pattern or no recurrence.

EXAMPLE

For **ss1_spa**, this command lists all scheduled tasks.

```
naviseccli -h ss1_spa nqm -schedule -list
```

OUTPUT

```
Name: TestScheduleRecurring
Current State: Scheduled
Next Start Time: Mon Apr 05 10:10:00 2004
Duration: 2 hours
Policy Name: TestCompletePolicy
Recurrence Type: Weekly
Frequency: Every 2 weeks
Pattern: Sunday, Monday and Tuesday

Name: TestScheduleRecurring
Current State: Running
Next Start Time: Mon Apr 05 12:00:00 2004
Duration: 4 hours
Policy Name: TestCompletePolicy
Recurrence Type: Weekly
Frequency: Every week
Pattern: Sunday

Name: TestScheduleRecurringDaily
Current State: Idle
Next Start Time: Mon Apr 05 16:00:00 2004
Duration: 2 hours
Policy Name: TestCompletePolicy
Recurrence Type: Daily
Frequency: Every day
Pattern: N/A

Name: TestScheduleNoRecurring
Current State: Idle
Next Start Time: Mon Apr 05 18:10:00 2004
Duration: 2 hours
Policy Name: TestCompletePolicy
Recurrence Type: None
Frequency: N/A
Pattern: N/Az
```

nqm -schedule -modify

Modifies a scheduled task.

PREREQUISITES

You must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **naviseccli nqm -schedule** command with the **-modify** switch modifies a specified scheduled task.

SYNTAX

```
nqm -schedule -modify -name schedulename [-newname newname]
[-policy policyname]
[-startdate mm/dd/yyyy ]
[-starttime hh:mm:ss]
[-duration hours:minutes ]
[-daily frequency] | [-weekly frequency -pattern [su] [mo] [tu] [we] [th]
[fr] [sa]] | -norecur
```

OPTIONS

-name *schedulename*

Specifies the existing scheduled task name.

-newname *newname*

Specifies a new name for the existing scheduled task.

-policy *policyname*

Indicates the policy name to which the scheduled task is associated.

-startdate *mm/dd/yyyy*

Indicates the date the task is scheduled to start.

-starttime *hh:mm:ss*

Indicates the time the task is scheduled to start.

-duration *hours:minutes*

Indicates the length of time the policy will run.

-daily *frequency*

Specifies that this scheduled task should occur daily at the specified frequency.

-weekly *frequency*

Specifies that this scheduled task should occur weekly at the specified frequency.

-pattern [su] [mo] [tu] [we] [th] [fr] [sa]

Specifies the list of weekdays, separated by spaces, that the task will reoccur. This switch should be specified only with the **-weekly** switch.

-norecur

Creates the scheduled task with no recurrence.

EXAMPLE

For **ss1_spa**, this command modifies the task **testSchedule**. The task will start on 6/11/2004 at 12:00:00 and will run for 5 hours and 30 minutes.

```
naviseccli -h ss1_spa nqm -schedule -modify -name testSchedule
 -startdate 6/11/2004 -starttime 12:00:00 -duration 5:30
```

OUTPUT

None

nqm -schedule -resume

Resumes a scheduled task.

PREREQUISITES

You must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **naviseccli nqm -schedule** command with the **-resume** switch resumes a scheduled task.

SYNTAX

nqm -schedule -resume -all | **-name** *schedulename*

OPTIONS

-all

Resumes all existing tasks.

-name *schedulename*

Specifies an existing scheduled task name.

EXAMPLE # 1

For **ss1_spa**, this command resumes the scheduled task **testSchedule**.

```
naviseccli -h ss1_spa nqm -schedule -resume -name testSchedule
```

EXAMPLE # 2

For **ss1_spa**, this command resumes all existing scheduled tasks.

```
naviseccli -h ss1_spa nqm -schedule -resume -all
```

OUTPUT

None

nqm -schedule -suspend

Suspends scheduled tasks.

PREREQUISITES

You must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **naviseccli nqm -schedule** command with the **-suspend** switch suspends a scheduled task.

SYNTAX

nqm -schedule -suspend -all | **-name** *schedulename* [**-o**]

OPTIONS

-all

Suspends all existing tasks.

-name *schedulename*

Specifies the existing scheduled task.

-o

Suspends a scheduled task without prompting for confirmation.

EXAMPLE # 1

For **ss1_spa**, this command suspends the task named **testSchedule**.

```
naviseccli -h ss1_spa nqm -schedule -suspend -name testSchedule
```

EXAMPLE # 2

For **ss1_spa**, this command suspends all scheduled tasks without prompting for confirmation.

```
naviseccli -h ss1_spa nqm -schedule -suspend -all -o
```

OUTPUT

None

nqm -setfallback

Sets or unsets a fallback policy.

PREREQUISITES

You must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **naviseccli nqm -setfallback** command will set or unset a fallback policy.

SYNTAX

nqm -setfallback -enable *pname* | **-disable**

OPTIONS

-enable *pname*

Enables and sets a fallback policy with the specified policy name.

-disable

Disables and unsets the fallback policy.

EXAMPLE

For **ss1_spa**, this command enables a fallback policy for **apolicy**.

```
naviseccli -h ss1_spa nqm -setfallback -enable apolicy
```

OUTPUT

None

nqm -setoptions

Toggles data logging and event control switches.

PREREQUISITES

You must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **naviseccli nqm -setoptions** command toggles data logging and event control switches.

SYNTAX

```
nqm -setoptions -logevent [[gs][gu][gn]]| none
```

OPTIONS

-logevent [[gs] [gu] [gn]] | none

Indicates if an event needs to be added in the event log due to the following four conditions:

gs: Goal satisfied

gu: Goal unattainable

gn: Goal no longer satisfied

none: Log no events

EXAMPLE

For **ss1_spa**, this command toggles the data logging and the event control switch. Events will be put into the event log if the goal is satisfied, unattainable, or no longer satisfied.

```
naviseccli -h ss1_spa nqm -setoptions -logevent gs gu gn
```

OUTPUT

None

nqm -stop

Stops the active policy immediately.

PREREQUISITES

You must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **naviseccli nqm -stop** command stops the active policy (running or measuring) immediately.

SYNTAX

```
nqm -stop [-nofallback][-o]
```

OPTIONS

-nofallback

Starts the fallback policy unless this switch is specified.

-o

Stops a policy without prompting for warning/confirmation.

EXAMPLE

For **ss1_spa**, the command immediately stops the active policy without starting the fallback policy.

```
naviseccli -h ss1_spa nqm -stop -nofallback
```

OUTPUT

None

Client tools

This section describes the QoS Manager client tools.

nqm -archive -dump

Dumps QoS Manager archive files.

PREREQUISITES

The host, username/password, and scope options of **naviseccli** are ignored since this command runs locally.

DESCRIPTION

The **naviseccli nqm** command with the **-archive -dump** command dumps the performance data, relationship, configuration, and statistics information in a format that you specify. You can specify the output format, XML or CSV, for the dumped information.

The **-archive -dump** command includes the following subcommands:

- **-data**
- **-rel**
- **-config**
- **-stats**

Note: The **-archive -dump** command recognizes and reports an error message when you try to open an encrypted archive file.

SYNTAX

```
nqm -archive -dump -data filename(s) [-out filename(s)]
[-join]
[-overwrite y|n]
[-xml|-delim code]
[-enquote code]
[-eol code]
[-header y|n]
[-object codes] [-format codes][-stime starttime]
[-ftime endtime][-timezone code][-progress]
```

or

```
nqm -archive -dump -rel filename(s) [-out filename(s)]
[-join]
[-overwrite y|n]
[-xml|-delim code]
[-enquote code]
[-eolcode]
```

```
[-root objcode]
[-level depth]
[-progress]
```

or

```
nqm -archive -dump -config filename(s) [-out filename(s)]
[-join]
[-overwrite y|n]
[-xml] [-delim code] [-enquote code]
[-eol code] [-object objcode][-progress]
```

or

```
nqm -archive -dump -stats filename(s) [-out filename(s)]
[-join][-overwrite y|n][-timezone code]
```

OPTIONS

-data *filename(s)*

Dumps data from archive files. You must provide the archive filename following the **-data** command.

Note: It lets you specify QoS Manager archive files and dump QoS Manager specific data.

The optional switches are as follows:

-out *filename(s)*

Dumps multiple files. Specify multiple output filenames separated by commas. The output filenames list corresponds to the dumped filenames list.

Note: You can dump multiple files into a single file using the **-join** switch.

-join

Appends the output from multiple files into a single file. The header will be dumped only once if this switch is used and if the header switch is enabled. This switch is valid only if you specify multiple files.

-overwrite y|n

Works with the **-out** switch. If you use the **-overwrite** switch without the **-out** switch, it is ignored. The **-overwrite** switch applies to all the output files if you specify multiple files to dump.

y = Without a warning, overwrites the existing file specified by the **-out** switch.

n = Displays an error message if the file that the **-out** switch specified already exists.

Note: If you try to overwrite a read-only file, an error message appears.

-xml

Specifies the output as XML format. This switch is optional, and you cannot use it with the **-delim** type. If you do not specify the **-xml** switch, delimited output results. If you use it with the **-data** command and the **-format** switch, an error message appears.

-delim *code*

Specifies a delimiter that separates the output data. With this switch, you can specify the output as delimited type. It is optional and cannot be used with the **-xml** switch. Specify the delimiter when you use this switch. If you do not specify either **-xml** or **-delim**, delimited output results.

Delimiter	Code
Comma (default)	cm
Semicolon	sc
Colon	cl
Tab	tb
Slash	sl
Backslash	bs
Period	pd
White space	ws

Note: If you use a slash or a period as a delimiter, you must also use the **-enquote** switch.

-enquote *code*

Encloses each performance characteristic within a set of special characters. If you specify the output type as **-xml**, an error message appears.

The possible special characters that you can use for the **-enquote** switch are listed below:

Enclosing character	Code
None	no
Quote	qu
Apostrophe	ap
Accent character	ac

Note: Use this switch only when you specify an output type as **-delimited**.

-eol *code*

Specifies a particular end-of-line character. The output reaches an end of line when all performance characteristics for one specific object at a particular time have been output. The underlying client system determines the default end-of-line character. If you specify the output type as **-xml**, an error message appears. The possible end-of-line characters for the switch are listed below:

End-of-line character	Code
Carriage return	cr
Line feed	lf

Note: Use this switch only when you specify an output type as **-delimited**.

-header y|n

Specifies whether to output a column header.

y = Output a header

n = Do not output a header

-object *codes*

Specifies the objects for which to collect the performance statistics and the order in which to output them. Not specifying this switch dumps all policy session objects.

Object type	Code
Policy session (QoS Manager)	ps

-format *codes*

Specifies which performance characteristics to output and the order in which they will appear. This switch is optional and cannot be used with the **-xml** switch. If you use the **-xml** switch with the **-format** switch, an error message appears. The **-format** switch requires one or more of the codes listed below. If you do not specify this switch, all performance characteristics are output in the order listed below:

Performance characteristic	Object type	Code
Object Name	All objects	on
Owner Array Name	All objects	oan
Poll Time	All objects	pt
Policy Start Time	Policy Session	psst
Policy End Time	Policy Session	pset
I/O Class Name	Policy Session	cn
I/O Delay	I/O Class	fd
Response Time (ms)	LUN, metaLUN, disk, SP, I/O Class, Snapshot, Thin LUN	rt
Total Bandwidth (MB/s)	LUN, metaLUN, disk, SP, I/O Class, Snapshot, Thin LUN	tb
Total Throughput (I/O/s)	LUN, metaLUN, disk, SP, I/O Class, Snapshot, Thin LUN	tt
Queue Depth	LUN, metaLUN, disk, SP, I/O Class, Snapshot, Thin LUN	qd

-stime *starttime*

Specifies an archive poll time to start iterating through the data. The **-stime** switch requires the start time to be in the following format:

mm/dd/yyyy hh:mm:ss

where:

mm is the month of a year (1-12)

dd is the day of a month (1-31)

yyyy is the four-digit year

hh is the hour of the day (0-23)

mm is the minute in an hour (0-59)

ss is the second in a minute (0-59).

You must enclose the time in double quotation marks.

The **-stime** switch works in combination with the **-ftime** switch, described below. If the start time is greater than the end time, an error message appears. If you do not specify a start time, this switch defaults to the earliest poll time in the archive file.

Note: If you use the **-stime** switch with the **-timezone** switch, you must apply the time zone to the start time.

If the start time you specify does not exist in the time interval of the archive file, an error message containing the valid time range of the archive file appears. Also, if the start time format is not valid, an error message appears.

-ftime *endtime*

Specifies an archive poll time to stop iterating through the data. The **-ftime** switch requires the end time to be in the following format:

mm/dd/yyyy hh:mm:ss

where:

mm is the month of a year (1-12)

dd is the day of a month (1-31)

yyyy is the four-digit year

hh is the hour of the day (0-23)

mm is the minute in an hour (0-59)

ss is the second in a minute (0-59).

You must enclose the time in double quotation marks.

The **-ftime** switch works in combination with the **-stime** switch, described above. If the start time is greater than the end time, an error message appears. If you do not specify an end time, this switch defaults to the latest poll time in the archive file.

Note: If you use the **-ftime** switch with the **-timezone** switch, you must apply the time zone to the end time.

If the end time you specify does not exist in the time interval of the archive file, an error message containing the valid time range of the archive file appears. Also, if the end time format is not valid, an error message appears.

-timezone *code*

Applies a particular time zone to the performance characteristic, Poll Time, included in the output data. By default, QoS Manager displays this characteristic in the local time of the client system. The possible time zones for the switch are listed below:

Time zone	Code
Local time (default)	local
Universal time	utc

-progress

Displays information about the current dump status, including the name of the file being dumped and the percentage dumped. An approximate value is calculated based on the number of objects for the percentage dumped information. This switch works with the **-out** switch. If you use the **-progress** switch without the **-out** switch, it is ignored. Do not use this switch in scripts.

-rel

Dumps the relationship information for the various objects in the archive file. Unisphere version 1.0 contains fully provisioned LUN support for QoS Manager. You can dump and display the fully provisioned LUN if it is part of any I/O class. You must provide the archive filename following the **-rel** command. You can specify multiple archive filenames separated by commas to dump the relationship information for all of them.

In addition to the switches, **-join**, **-out**, **-overwrite**, **-progress**, **-eol**, and **-enquote** (which are described above), you can also use the following optional switches with the **-rel** command:

-xml

Specifies the output in XML format. This switch is optional and you cannot use it with the **-delim** type. If you do not specify the **-xml** switch, delimited output results.

-delim

Specifies the output as delimited. In the delimited format, the relationship is dumped in a logical tree format, whereby each node appears on a separate line.

-config

Dumps the configuration information of objects in the archive file. You must provide the archive filename following the **-config** command. You can specify multiple archive files separated by commas to dump the configuration information for all of them. In addition to the switches, **-join**, **-out**, **-overwrite**, **-progress**, **-delim**, **-enquote**, and **-eol** (which are described above), you can also use the following optional switches with the **-config** command:

-object *objcode*

Specifies which objects and in what order you want to dump the configuration information. If you do not specify this switch, all object types are dumped in the order of policies, I/O classes, metaLUNs, FLARE LUNs, thin LUNs, fully provisioned LUNs, and snapshot LUNs. If you use the plu object code for pool-based LUNs, the tl option for thin LUNs is ignored. Use the al object code to dump all LUN targets including metaLUNs, FLARE LUNs, thin LUNs, fully provisioned LUNs, and snapshot LUNs. All other object codes are ignored if you specify the al object code.

Object type	Code
Policy session	ps
I/O class	cl
All LUNs (including all supported public LUNs)	al
metaLUN	ml
FLARE LUN	l
Thin LUN	tl
Pool LUN (including thin LUN and fully provisioned LUN)	plu
Snapshot LUN	sl

-xml

Specifies the output in XML format. This switch is optional and you cannot use it with the **-delim** type. If you do not specify the **-xml** switch, delimited output results.

-stats *archive filename(s)*

Dumps the statistical information for multiple archive files. A blank line separates dumped information of different files. You can use the following optional switches with the **-stats** command: **-join**, **-out**, **-overwrite** (which are described above).

EXAMPLE # 1

This command lets you dump data from the archive file `archive.nqm` without outputting a header.

```
naviseccli -h ss1_spa nqm -archive -dump -data archive.nqm -header n
```

EXAMPLE # 2

This command lets you dump relationship information of various objects in the archive file `archive.nqm` and output it in XML format.

```
naviseccli -h ss1_spa nqm -archive -dump -rel archive.nqm -xml
```

EXAMPLE # 3

This command lets you dump configuration information of objects in the archive file `archive.nqm`; if the output file `archive.csv` exists, the system overwrites it without a warning.

```
naviseccli -h ss1_spa nqm -archive -dump -config archive.nqm -out archive.csv
 -overwrite y
```

EXAMPLE # 4

This command lets you dump statistical information for multiple archive files `archive1.nqm` and `archive2.nqm`.

```
naviseccli -h ss1_spa nqm -archive -dump -stats archive1.nqm, archive2.nqm
```

OUTPUT

Varies depending upon which switch you use.

nqm -archive -retrieve

Retrieves QoS Manager archive files.

PREREQUISITES

You must have a user account on the system on which you want to execute the command.

Note: The **navicli** nqm command is not required for the **-archive -retrieve** command to run.

DESCRIPTION

The **naviseccli nqm** command with the **-archive -retrieve** command lets you create and retrieve the archive files from the system.

SYNTAX

```
nqm -archive -retrieve -file filename [-location directorypath]
[-overwrite y|n]
[-retry number]
[-v]
```

OPTIONS

-file *filename*

Specifies the name of the archive file once it is retrieved to the client system.

-location *directorypath*

Specifies the path location of the archive file once it is retrieved to the client system. If you do not specify a location, QoS Manager uses the current working directory.

-overwrite y|n

Specifies whether to overwrite an existing archive file on the client system. If the specified archive file already exists and this switch is not used, the command fails.

y = Without a warning, overwrites the existing file specified by the **-out** switch.

n = Displays an error message if the file that the **-out** switch specified already exists.

-retry *number*

Specifies the number of times to retry a retrieval before giving up completely. A retry will occur only when the actual move of the archive file from the system to the client system fails.

-v

As the retrieval process progresses, the status of each stage will be output.

EXAMPLE

This command retrieves an archive to the file, `archive.nqm` in `c:\Temp`, overwrites the existing file and retries two times.

```
naviseccli -h ss1_spa nqm -archive -retrieve -file archive.nqm -location
c:\temp -overwrite y -retry 2
```

OUTPUT

None

8

EMC Unisphere Analyzer

This chapter introduces the EMC® Unisphere™ Analyzer performance monitor application, which measures the performance of disk-array storage systems. Users of previous versions of EMC CLARiiON® software should note that EMC Navisphere® Analyzer has been changed to Unisphere Analyzer. This software, with the exception of new features, remains entirely identical in function. The Analyzer CLI commands and syntax have been preserved and can be used on systems that are running Unisphere within the limits of interoperability expressed in the release notes.

Major topics are:

About Unisphere Analyzer

Analyzer works within storage domains that the web-based Unisphere software administers. It gathers system performance statistics and presents them in various types of charts. These charts can help you find and anticipate bottlenecks in the disk storage component of a computer system.

Analyzer has two parts: a provider program that accumulates performance information and a user interface (UI). For information about the Analyzer UI, see the Unisphere online help.

The Analyzer enabler must be installed on any system you want to analyze. It controls, accumulates, and manages access to performance information on storage processors (SPs), logical units (LUNs), and disks. The new information displaces the old. This manual uses the term *LUN* to refer to LUNs, metaLUNs, fully provisioned LUNs, and thin LUNs, except where explicitly noted.

Analyzer can display the performance data directly (in real time) or as a file containing past performance data from an archive. It can display real time and archive file data simultaneously. You can compare charts from different systems (using real time data) or you can compare different times on one system (using real time and archive data).

Analyzer chart types

Analyzer has seven types of charts:

- Performance Overview
- Performance Survey
- Performance Summary
- Performance Detail
- IO Size Distribution Summary (for LUNs and metaLUNs only)
- IO Size Distribution Detail (for LUNs and metaLUNs only)
- LUN IO Disk Detail (for LUNs only)

Prerequisites

Analyzer requires the following:

- Unisphere software must be installed and enabled on at least one of the systems in the system domain that you want to analyze.
- Analyzer must be enabled on the system you want to analyze.
- The correct version of the Java Runtime Environment (JRE) must be on the client from which you run the browser.

For the latest requirements, see the release notes supplied with the software.

Analyzer CLI commands

This section explains the **naviseccli** command and the commands for monitoring and measuring the performance of AX4-5 series, CX4 series, CX3 series, and CX series systems with the Analyzer option.

Note: Please note that Secure CLI is replacing Java CLI; therefore, only Secure CLI will support new features. We recommend that you use Secure CLI. Secure CLI is also faster and more secure than Java CLI. Please refer to the *Navisphere Command Line Interface (CLI) Reference* for Java CLI support.

The commands in this section function only with a system that has the optional Analyzer software installed.

---

analyzer -set

Modifies the performance logging properties.

PREREQUISITES

You must have a user account on the system on which you want to execute the command. If one of the switches is specified, the user account needs the administrator or manager role.

DESCRIPTION

The **naviseccli analyzer** command with the **-set** switch lets you modify the performance logging properties.

analyzer -set is used with **naviseccli** (naviseccli on page 35).

SYNTAX

```
analyzer  -set [-narinterval seconds] [-rtinterval seconds]
[-nonstop|-logperiod days]
[-periodicarchiving 0|1] [-default]
```

OPTIONS

-narinterval *seconds*

Changes the polling interval for performance logging. The allowable range is 60 to 3600, and the default is 120. Modifying this value affects the duration of the data in the file. For example, at 600 seconds an archive should have approximately 26 hours of data. If you lower the rate to 1200 seconds, the archive file would have approximately 52 hours of data.

-rtinterval *seconds*

Changes the polling interval for real-time chart windows. The valid range is 60 to 3600; the default is 60.

-nonstop

Sets performance logging to run non-stop.

-logperiod *days*

Sets performance logging to run for a period of days. The valid range is 1 to 7 days; the default is 7 days.

-periodicarchiving 0 | 1

When you set **-periodicarchiving** to **1**, performance logging automatically creates archive files at periods of 156 samples. The default is **0**, no periodic archiving.

-default

Resets the values of all performance properties back to their default values. It does not change the **-nonstop** or **-logperiod** switch when performance logging is running.

You cannot specify **-nonstop** and **-logperiod** in the same command line. If you do not specify any switches, you will get back the current values.

EXAMPLE # 1

This command sets the archive interval to 20 minutes.

```
naviseccli -h ss1_spa analyzer -set -narinterval 1200
```

EXAMPLE # 2

This command sets the archive interval back to 2 minutes.

```
naviseccli -h ss1_spa analyzer -set -default
```

OUTPUT

None if the command succeeds; status or error information if it fails.

analyzer -get

Returns the current values of the performance logging properties.

PREREQUISITES

You must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **naviseccli analyzer** command with the **-get** switch lets you view the current values of the performance logging properties for the switch you specify.

analyzer -get is used with **naviseccli** (refer to naviseccli on page 35).

SYNTAX

```
analyzer -get [-narinterval ] [-rtinterval ] [-logperiod ]
[-periodicarchiving ]
```

OPTIONS

-narinterval

Returns the current archive polling interval in seconds.

-rtinterval

Returns the current real-time polling interval in seconds.

-logperiod

Returns the current logging period (number of days or nonstop).

-periodicarchiving

Returns the **-periodicarchiving** setting, No or Yes.

Note: If you do not specify any switches, the **analyzer -get** command displays all the current values.

EXAMPLE

This command returns the current archive interval.

```
naviseccli -h  ss1_spa analyzer -get -narinterval
```

OUTPUT

For this example, the output is:

```
Archive Poll Interval (sec): 600
```

analyzer -logging

Resets performance logging.

PREREQUISITES

You must have a user account on the system on which you want to execute the command. You need administrator or manager privileges to use this command.

DESCRIPTION

The **naviseccli analyzer** command with the **-logging** switch lets you reset performance logging.

analyzer -logging is used with **naviseccli** (refer to naviseccli on page 35).

SYNTAX

```
analyzer -logging [-reset]
```

OPTIONS

-reset

Stops performance logging. It deletes all the data that the Analyzer provider has collected. Then it starts performance logging.

EXAMPLE

This command resets performance logging.

```
naviseccli -h  ss1_spa analyzer -logging -reset
```

OUTPUT

None if the command succeeds; status or error information if it fails.

analyzer -start

Starts performance logging.

PREREQUISITES

You must have a user account on the system on which you want to execute the command. You need administrator or manager privileges to use this command.

DESCRIPTION

The **naviseccli analyzer** command with the **-start** switch starts performance logging. It turns on statistics logging if it is not on already.

analyzer -start is used with **naviseccli** (refer to naviseccli on page 35).

SYNTAX

```
analyzer -start
```

EXAMPLE

This command starts performance logging.

```
naviseccli -h  ss1_spa analyzer -start
```

OUTPUT

None if the command succeeds; status or error information if it fails.

analyzer -stop

Stops performance logging.

PREREQUISITES

You must have a user account on the system on which you want to execute the command. You need administrator or manager privileges to use this command.

DESCRIPTION

The **naviseccli analyzer** command with the **-stop** switch stops performance logging. It restores the statistics logging state to what it was before logging was started.

analyzer -stop is used with **naviseccli** (refer to naviseccli on page 35).

SYNTAX

```
analyzer  -stop
```

EXAMPLE

This command stops performance logging.

```
naviseccli -h  ss1_spa analyzer -stop
```

OUTPUT

None if the command succeeds; status or error information if it fails.

analyzer -status

Displays performance logging status.

PREREQUISITES

You must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **naviseccli analyzer** command with the **-status** switch lets you see the current status of performance logging. Possible status includes the following:

- `Running. Started on date time`
- `Stopped`
- `Stopped on date time`

analyzer -status is used with **naviseccli** (refer to naviseccli on page 35).

SYNTAX

```
analyzer -status
```

EXAMPLE

This command provides the current status of performance logging.

```
naviseccli -h  ss1_spa analyzer -status
```

OUTPUT

For this example, the output is:

```
Running. Started on 10/17/2006 13:27:32
```

analyzer -archive

Manages archive files.

PREREQUISITES

You must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **naviseccli analyzer** command with the **-archive** switch lets you list, retrieve, or delete one or more archive files from an SP. It retrieves both the encrypted and decrypted archive files.

SYNTAX

```
analyzer  -archive
[[-list][-path pathname][-o][-all|-file filenames][-delete]]
or
analyzer -archive
[-new|-statusnew filename]
```

OPTIONS

-list

Lists all the archive files, ignoring all other switches.

-path *pathname*

Retrieves files to the path you specify. If you do not specify a pathname, files are retrieved to the current directory.

-o

Does not display warning messages.

-all

Retrieves all archive files.

-file *filenames*

Retrieves archive files you specify.

-delete

Deletes files you select or specify with the **-all** or **-file** switches. If you do not specify the **-o** switch, a warning message lists files to delete and asks for confirmation.

-new

Immediately creates a new archive file and output name for the new archive file. If you cannot create a new archive file because less than ten samples were collected, this switch returns the name of the newest archive file.

-statusnew *filename*

Returns the status of the new archive file, *filename*, which you created with the **-new** switch. The possible status is **done** or **not done**.

EXAMPLE

This command lists all the archive files.

```
naviseccli -h  ss1_spa analyzer -archive -list
```

OUTPUT

```
Index Size in KB Last Modified Filename
0     39         10/04/2006 16:07:24
APM00035101236_SPA_2006-10-04_20-07-21-GMT_M05-00.nar
1     60         10/06/2006 10:39:56
APM00035101236_SPA_2006-10-06_14-39-56-GMT_M05-00.nar
2     114        10/06/2006 13:49:51
APM00035101236_SPA_2006-10-06_17-49-50-GMT_M05-00.nar
3     68         10/08/2006 12:12:42
APM00035101236_SPA_2006-10-08_16-12-42-GMT_M05-00.nar
4     68         10/08/2006 14:48:42
APM00035101236_SPA_2006-10-08_18-48-42-GMT_M05-00.nar
5     70         10/08/2006 17:24:42
APM00035101236_SPA_2006-10-08_21-24-42-GMT_M05-00.nar
6     70         10/08/2006 20:00:42
APM00035101236_SPA_2006-10-09_00-00-42-GMT_M05-00.nar
7     71         10/08/2006 22:36:42
APM00035101236_SPA_2006-10-09_02-36-42-GMT_M05-00.nar
8     70         10/09/2006 01:12:42
APM00035101236_SPA_2006-10-09_05-12-42-GMT_M05-00.nar
9     70         10/09/2006 03:48:42
APM00035101236_SPA_2006-10-09_07-48-42-GMT_M05-00.nar
10    71         10/09/2006 06:24:42
APM00035101236_SPA_2006-10-09_10-24-41-GMT_M05-00.nar
11    69         10/09/2006 09:00:42
APM00035101236_SPA_2006-10-09_13-00-42-GMT_M05-00.nar
12    72         10/09/2006 11:36:42
APM00035101236_SPA_2006-10-09_15-36-42-GMT_M05-00.nar
```

Client tools

This section describes the Analyzer client tools that you use with **naviseccli**.

analyzer -archivedump

Dumps Analyzer archive files.

PREREQUISITES

The host, username/password and scope options of **naviseccli** are ignored since this command runs locally.

DESCRIPTION

The **naviseccli analyzer** command with the **-archivedump** command dumps the performance data, relationship, and configuration information in a format that you specify.

Note: The **-archivedump** command recognizes and reports an error message when you try to open an encrypted archive file.

The **-archivedump** command includes the following subcommands:

- **-data**
- **-stats**
- **-rel**
- **-config**

analyzer -archivedump is used with **naviseccli** (refer to naviseccli on page 35).

SYNTAX

```
analyzer  -archivedump -data filename(s) [-out filename(s)] [-join]
[-overwrite y|n] [-xml| -delim code] [- enquote code]
[-eol code]
[-header y|n] [-object codes] [-format codes]
[-stime starttime] [-ftime endtime] [-timezone code]
[-progress]

analyzer  -archivedump -stats filename(s) [-out filename(s)] [-join]
[-overwrite y|n] [-timezone code]

analyzer  -archivedump -rel filename(s) [-out filename(s)] [-join]
[-overwrite y|n] [-xml| -delim code ] [- enquote code]
[-eol code] [-root objcode] [-level depth] [-progress]

analyzer  -archivedump -config filename(s) [-out filename(s)] [-join]
[-overwrite y|n] [-xml| -delim code] [- enquote code]
[-eol code] [-object objcode] [-progress]
```

OPTIONS

-data *filename(s)*

Dumps data from archive files. You must provide the archive filename following the **-data** command. The optional switches are as follows:

-out *filename(s)*

Dumps multiple files. Specify multiple output filenames separated by commas. The output filenames list corresponds to the dumped filename list.

Note: You can dump multiple files into a single file using the **-join** switch.

-join

Appends the output from multiple files into a single file. The header will be dumped only once if this switch is used and if the header switch is enabled. This switch is valid only if you specify multiple files. If you use this switch with the single file following **-data**, the switch is ignored.

overwrite y|n

Works with the **-out** switch. If you use the **-overwrite** switch without the **-out** switch, it is ignored. The **-overwrite** switch applies to all the output files if you specify multiple files to be dumped.

y	Without a warning, overwrites the existing file specified by the **-out** switch.
n	Displays an error message if the file that the **-out** switch specified already exists.

Note: If you try to overwrite a read-only file, an error message appears.

-xml

Specifies the output in XML format. This switch is optional, and you cannot use it with the **-delim** type. If you do not specify the **-xml** switch, delimited output results. If you use it with the **-data** command and the **-format** switch, an error message appears.

-delim *code*

Specifies a delimiter that separates the output data. With this switch, you can specify the output as delimited type. It is optional and cannot be used with the **-xml** switch. Specify the delimiter when you use this switch. If you do not specify either **-xml** or **-delim**, delimited output results.

Delimiter	Code
Comma (default)	cm

Delimiter	Code
Semicolon	sc
Colon	cl
Tab	tb
Slash	sl
Backslash	bs
Period	pd
White space	ws

Note: If you use a slash or a period as a delimiter, you must also use the **-enquote** switch with an option other than None.

-enquote *code*

Encloses each performance characteristic within a set of special characters. By default, the special characters None are used. The possible special characters for the switch are listed below:

Enclosing character	Code
None	no
Quote	qu
Apostrophe	ap
Accent character	ac

Note: Use this switch only when you specify **-delimited** as an output type.

-eol *code*

Specifies a particular end-of-line character. The output reaches an end of line when all performance characteristics for one specific object at a particular time have been output. The underlying client system determines the default end-of-line character. The possible end-of-line characters for the switch are listed below:

End-of-line character	Code
Carriage return	cr
Line feed	lf

Note: Use this switch only when you specify **-delimited** as an output type.

-header **y | n**

Specifies whether to output a column header. This switch is optional. If you do not specify the switch, by default, it outputs a header.

y	Output a header.
n	Do not output a header.

-object *codes*

Specifies the objects for which to collect performance statistics and the order in which to output them. If you do not specify this switch, all object types are dumped in the following order: SPs, public FLARE LUNs, metaLUNs, fully provisioned LUNs, thin LUNs, private FLARE LUNs, disks, MirrorView/A, Snap sessions, RAID groups, pools, and ports. If the objects have no performance data, no information is dumped. With Unisphere version 1.0, fully provisioned LUNs do not have performance data.

Object type	Code
SP	s
LUN[a]	l
MetaLUN	ml
Disk	d
Asynchronous mirror	am
Snap session	ss
RAID group	rg
Port	p
Private FLARE LUNs and private pool LUNs[b]	pl
Host LUN[c]	hl
Thin LUN[d]	tl
All LUNs	al
Public/private pool LUNs	plu
Thin pool	tp

[a] RAID group based public or private LUNs
[b] Private LUNs are metaLUN components and other reserved LUNs.
[c] Host LUNs are all LUNs with host I/O.
[d] Thin LUNs are LUNs whose storage capacity grows by using a shared pool of storage. They dump only the host statistics.

Object type	Code
Pool [e]	pool

-format *codes*

Specifies which performance characteristics to output and the order in which they appear. The **-format** switch requires one or more of the codes listed below. If you do not specify this switch, all performance characteristics are output in the order listed below:

Performance characteristic	Object type	Code
Object Name	All objects	on
Poll Time	All objects	pt
Owner Array Name	All objects	oan
Current Owner	LUN, metaLUN, pool-based LUN	co
Utilization (%)	LUN, metaLUN, pool-based LUN, disk, SP	u
Queue Length	LUN, metaLUN, pool-based LUN, disk, SP	ql
Response Time (ms)	LUN, metaLUN, pool-based LUN, disk, SP	rt
Total Bandwidth (MB/s)	LUN, metaLUN, pool-based LUN, disk, SP, asynchronous mirror, port	tb
Total Throughput (I/O/s)	LUN, metaLUN, pool-based LUN, disk, SP, asynchronous mirror, port	tt
Read Bandwidth (MB/s)	LUN, metaLUN, pool-based LUN, disk, SP, port	rb
Read Size (KB)	LUN, metaLUN, pool-based LUN, disk, SP, port	rs
Read Throughput (I/O/sec)	LUN, metaLUN, pool-based LUN, disk, SP, port	rio
Write Bandwidth (MB/s)	LUN, metaLUN, pool-based LUN, disk, SP, port	wb
Write Size (KB)	LUN, metaLUN, pool-based LUN, disk, SP, port	ws

[e] Thin pool and pool mean the same object. Thin pool is kept for backward compatibility purposes in Unisphere version 1.0

Performance characteristic	Object type	Code
Write Throughput (I/O/sec)	LUN, metaLUN, pool-based LUN, disk, SP, port	wio
Full Stripe Write/s	LUN, metaLUN	fsw
Prefetch Bandwidth (MB/s)	LUN, metaLUN	pb
Used Prefetches (%)	LUN, metaLUN	up
Read Cache Hits/s	LUN, metaLUN	rch
Read Cache Misses/s	LUN, metaLUN	rcm
Reads From Write Cache/s	LUN, metaLUN	rfwc
Reads from Read Cache/s	LUN, metaLUN	rfrc
Read Cache Hit Ratio	LUN, metaLUN	rchr
Write Cache Hits/s	LUN, metaLUN	wch
Write Cache Misses	LUN, metaLUN	wcm
Write Cache Rehits/s	LUN, metaLUN	wcr
Write Cache Hit Ratio	LUN, metaLUN	wchr
Write Cache Rehit Ratio	LUN, metaLUN	wcrr
complete histogram (r512b through t512kb)	LUN, metaLUN	histo
Read histogram (r512b through r512kb)	LUN, metaLUN	rhisto
Write histogram (w512b through w512kb)	LUN, metaLUN	whisto
Total histogram (t512b through t512kb)	LUN, metaLUN	thisto
Forced Flushes/s	LUN, metaLUN	ff
Disk Crossings (%)	LUN, metaLUN	dcp
Average Busy Queue Length	LUN, metaLUN, pool-based LUN, disk, SP	abql
Disk Crossing/s	LUN, metaLUN	dc
Service Time (ms)	LUN, metaLUN, pool-based LUN, disk, SP	st
LUN Read Crossings/s	metaLUN	krc
LUN Write Crossings/s	metaLUN	lwc
Average Seek Distance (GB)	disk	asd
Dirty Pages (%)	SP	dp
Flush Ratio	SP	fr

Performance characteristic	Object type	Code
MBs Flushed (MB/s)	SP	mbf
High Water Flush On	SP	hwfo
Idle Flush On	SP	ifo
Low Water Flush Off	SP	lwfo
Write Cach Flushes/s	SP	wcf
Reads from Snapshot Cache	Snap Session	rfsc
Reads from Snapshot Copy LUN	Snap Session	rfsnl
Reads from Snapshot Source LUN	Snap Session	rfssl
Writes To SnapShot Source LUN	Snap Session	wssl
Writes To Snapshot Cache	Snap Session	wsc
Writes Larger Than Snapshot Cache Chunk Size	Snap Session	wltsccs
Chunks Used in Snapshot Copy Session	Snap Session	cuscs
Average Transfer Size (KB)	Asynchronous Mirror	amats
Time Lag (min)	Asynchronous Mirror	amtl
Data Lag (MB)	Asynchronous Mirror	amml
Cycle Count	Asynchronous Mirror	amcc
Average Cycle Time (min)	Asynchronous Mirror	amact
Read 512B	LUN, metaLUN	r512b
Read 1KB+	LUN, metaLUN	r1kb
Read 2KB+	LUN, metaLUN	r2kb
Read 4KB+	LUN, metaLUN	r4kb
Read 8KB+	LUN, metaLUN	r8kb
Read 16KB+	LUN, metaLUN	r16kb
Read 32KB+	LUN, metaLUN	r32kb
Read 64KB+	LUN, metaLUN	r64kb
Read 128KB+	LUN, metaLUN	r128kb
Read 256KB+	LUN, metaLUN	r256kb
Read 512KB+	LUN, metaLUN	r512kb
Write 512B	LUN, metaLUN	w512b

Performance characteristic	Object type	Code
Write 1KB+	LUN, metaLUN	w1kb
Write 2KB+	LUN, metaLUN	w2kb
Write 4KB+	LUN, metaLUN	w4kb
Write 8KB+	LUN, metaLUN	w8kb
Write 16KB+	LUN, metaLUN	w16kb
Write 32KB+	LUN, metaLUN	w32kb
Write 64KB+	LUN, metaLUN	w64kb
Write 128KB+	LUN, metaLUN	w128kb
Write 256KB+	LUN, metaLUN	w256kb
Write 512KB+	LUN, metaLUN	w512kb
Total 512B	LUN, metaLUN	t512b
Total 1KB+	LUN, metaLUN	t1kb
Total 2KB+	LUN, metaLUN	t2kb
Total 4KB+	LUN, metaLUN	t4kb
Total 8KB+	LUN, metaLUN	t8kb
Total 16KB+	LUN, metaLUN	t16kb
Total 32KB+	LUN, metaLUN	t32kb
Total 64KB+	LUN, metaLUN	t64kb
Total 128KB+	LUN, metaLUN	t128kb
Total 256KB+	LUN, metaLUN	t256kb
Total 512KB+	LUN, metaLUN	t512kb
Queue Full Count	port	qfc
FAST Cache Read Hit Ratio	LUN, Pool	fcrhr
FAST Cache Write Hit Ratio	LUN, Pool	fcwhr
FAST Cache Read Hits/s	LUN, Pool	fcrh
FAST Cache Write Hits/s	LUN, Pool	fcwh
FAST Cache Read Misses/s	LUN, Pool	fcrm
FAST Cache Write Misses/s	LUN, Pool	fcwm
FAST Cache Dirty Pages [%]	SP	fcdp
FAST Cache Flushed MB/s	SP	fcmbf

The options of new performance characteristics are as shown below:

Optimal performance characteristics	Nonoptimal performance characteristics	Optimal/nonoptimal code	Object type
Utilization-Optimal[%]	Utilization-Nonoptimal[%]	uo/un	LUN, metaLUN, pool-based LUN
Queue Length-Optimal	Queue Length-Nonoptimal	qlo/qln	LUN, metaLUN, pool-based LUN
Response time-Optimal [ms]	Response time-Nonoptimal [ms]	rto/rtn	LUN, metaLUN, pool-based LUN
Total Bandwidth-Optimal [MB/s]	Total Bandwidth-Nonoptimal [MB/s]	tbo/tbn	LUN, metaLUN, pool-based LUN
Total Throughput-Optimal [IO/s]	Total Throughput-Nonoptimal [IO/s]	tto/ttn	LUN, metaLUN, pool-based LUN
Read Bandwidth-Optimal[MB/s]	Read Bandwidth-Nonoptimal[MB/s]	rbo/rbn	LUN, metaLUN, pool-based LUN
Read Size-Optimal[KB]	Read Size-Nonoptimal[KB]	rso/rsn	LUN, metaLUN, pool-based LUN
Read Throughput-Optimal[IO/s]	Read Throughput-Nonoptimal[IO/s]	rioo/rion	LUN, metaLUN, pool-based LUN
Write Bandwidth-Optimal[MB/s]	Write Bandwidth-Nonoptimal[MB/s]	wbo/wbn	LUN, metaLUN, pool-based LUN
Write Size-Optimal [KB]	Write Size-Nonoptimal [KB]	wso/wsn	LUN, metaLUN, pool-based LUN
Write Throughput-Optimal[IO/s]	Write Throughput-Nonoptimal[IO/s]	wioo/wion	LUN, metaLUN, pool-based LUN
Average Busy Queue Length-optimal	Average Busy Queue Length-Nonoptimal	abqlo/abqln	LUN, metaLUN, pool-based LUN
Service Time - Optimal [ms]	Service Time - Nonoptimal [ms]	sto/stn	LUN, metaLUN, pool-based LUN
Explicit Trespass Count		etc	LUN, metaLUN, pool-based LUN
Implicit Trespass Count		itc	LUN, metaLUN, pool-based LUN
Implicit Trespass Count–Optimal	Implicit Trespass Count–Nonoptimal	itco/itcn	LUN, metaLUN, pool-based LUN
Explicit Trespass Count–Optimal	Explicit Trespass Count–Nonoptimal	etco/etcn	LUN, metaLUN, pool-based LUN

The following table is an example of the **-archivedump** command, which displays optimal and nonoptimal statistics and also displays the current owner:

Object name	Owner array name	Current owner	Utilization(%)	Utilization-optimal [%]	Response time-optimal [ms]
LUN 2	HK192200361	A	0	0	0
LUN 1	HK192200361	B	8.153079	8.153079	34.986851

-stime *starttime*

Specifies an archive poll time from which to start iterating through the data. The **-stime** switch requires start time to be in the following format:

mm/dd/yyyy hh:mm:ss

where:

mm	is the month of a year (1-12)
dd	is the day of a month (1-31)
yyyy	is the four-digit year
hh	is the hour of the day (0-23)
mm	is the minute in an hour (0-59)
ss	is the second in a minute (0-59)

You must enclose the time in double quotation marks.

The **-stime** switch works in combination with the **-ftime** switch, described below. If the start time is greater than the end time, an error message appears. If you do not specify an end time, this switch defaults to the latest poll time in the archive file.

Note: If you use the **-stime** switch with the **-timezone** switch, you must apply the time zone you specify to the start time.

If the start time you specify does not exist in the time interval of the archive file, an error message containing the valid time range of the archive file appears. Also, if the start time format is not valid, an error message appears.

-ftime *endtime*

Specifies an archive poll time at which to stop iterating through the data. The **-ftime** switch requires end time to be in the following format:

mm/dd/yyyy hh:mm:ss

where:

mm	is the month of a year (1-12)

dd	is the day of a month (1-31)
yyyy	is the four-digit year
hh	is the hour of the day (0-23)
mm	is the minute in an hour (0-59)
ss	is the second in a minute (0-59)

You must enclose the time in double quotation marks.

The **-ftime** switch works in combination with the **-stime** switch, described above. If the start time is greater than the end time, an error message appears. If you do not specify an end time, this switch defaults to the latest poll time in the archive file.

Note: If you use the **-ftime** switch with the **-timezone** switch, you must apply the time zone you specify to the end time.

If the end time you specify does not exist in the time interval of the archive file, an error message containing the valid time range of the archive file appears. Also, if the end time format is not valid, an error message appears.

-timezone *code*

Applies a particular time zone to the performance characteristic, Poll Time, included in the output data. By default, Analyzer displays this characteristic in the local time of the client system. The possible time zones for the switch are listed below:

Time zone	Code
Local time (default)	local
Universal time	utc

-progress

Displays information about the current dump status, including the name of the file being dumped and the percentage dumped. An approximate value is calculated based on the number of objects for the percentage dumped information. This switch works with the **-out** switch. If you use the **-progress** switch without the **-out** switch, it is ignored. Do not use this switch in scripts.

-stats

Dumps the statistical information for multiple archive files. Dumped information of different files is separated by a blank line. The output information includes the start time, end time, total number of objects, LUNs, SPs, disks, metaLUNs, pools, thin LUNs, snap sessions, and the number of other objects such as host and system. You can use the following switches with the **-stats** command: **-out**, **-join**, **-overwrite**, and **-timezone** *codes* (described above). The **-stats** command does not support **-xml** format.

-rel

Dumps the relationship information among the various objects in the archive file. You must provide the archive filename following the **-rel** command. You can specify multiple archive files separated by commas to dump the relationship information of all of them.

In addition to the switches **-join**, **-out**, **-overwrite**, **-progress**, **-enquote**, **-eol**, **-xml**, **-delim** and **-progress** (described above), you can also use the following optional switches with the **-rel** command:

-root *objcode*

Dumps the relationship information about the specified root and its subnodes. The following object codes specify the object types of a root node:

Object type	Code
SP	s
Disk	d
Asynchronous mirror	am
Snap session	ss
RAID group	rg
Host	h
Storage System	stor
MetaLUN	ml
LUN [a]	l
port	p
Private FLARE LUNs and private pool LUNs (CX4 series only)[b]	pl
Host LUN (CX4 series only)[c]	hl
Thin LUN[d]	tl
Thin pool[e]	tp
All LUNs	al
Public/private pool LUNs	plu

[a] RAID group based public or private LUNs
[b] Private LUNs are metaLUN components and other reserved LUNs.
[c] Host LUNs are all LUNs with host I/O.
[d] Thin LUNs are LUNs whose storage capacity grows by using a shared pool of storage.
[e] Thin pools are sets of disks, all with the same redundancy, that share their user capacity with one or more thin LUNs.

Object type	Code
Pool[f]	pool

Note: Not specifying the switch dumps the relationship information for the system. If you specify multiple switches for this option, an error message appears.

-level *depth*

Specifies the depth of the relationship information to be dumped. Specify the level number as an integer. For example, specifying the level as 2 dumps the immediate subnodes of all the objects of the type you specified with the **-root** switch. Specifying the level as 1 dumps the name of all object types you specified with the **-root** switch. If you specify a level as 0, an error message appears. Not specifying this switch dumps the complete hierarchy of all the objects of the type specified with the **-root** switch.

[f] Thin pool and pool mean the same object. Thin pool is kept for backward compatibility purposes in Unisphere version 1.0

-config

Dumps the configuration information of objects in the archive file. You must provide the archive filename following the **-config** command. You can specify multiple archive files separated by commas to dump the configuration information for all of them.

You can use the following switches with the **-config** command: **-out**, **-join**, **-overwrite**, **-xml**, **-delim**, **-enquote**, **-eol**, and **-progress** (described above).

-object *objcode*

Specifies for which objects and in what order you want to dump the configuration information. If you do not specify this switch, all object types are dumped in the following order: SPs, public FLARE LUNs, metaLUNs, fully provisioned LUNs, thin LUNs, private FLARE LUNs, disks, MirrorView/A, Snap sessions, RAID groups, pools, hosts, systems, and ports.

Object type	Code
SP	s
Disk	d
Snap session	ss
Asynchronous mirror	am
RAID group	rg
Host	h
Storage System	stor
metaLUN	ml
LUN	l
Port	p
Private FLARE LUNs and private pool LUNs (CX4 series only)	pl
Host LUN (CX4 series only)	hl
Thin LUN	tl
Thin pool	tp
All LUNs	al
Public/private pool LUNs	plu
Pool	pool

EXAMPLE # 1

This command lets you dump data from the archive file `archive.nar` without outputting a header.

```
naviseccli analyzer -archivedump -data archive.nar -header n
```

EXAMPLE # 2

This command lets you dump statistical information for multiple archive files, `archive1.nar` and `archive2.nar`.

```
naviseccli analyzer -archivedump -stats archive1.nar,archive2.nar
```

EXAMPLE # 3

This command lets you dump relationship information of various objects in the archive file `archive.nar` and outputs it in XML format.

```
naviseccli analyzer -archivedump -rel archive.nar -xml
```

EXAMPLE # 4

This command lets you dump configuration information of objects in the archive file `archive.nar`; if the output file `archive.csv` exists, this command overwrites it without a warning.

```
naviseccli analyzer -archivedump -config archive.nar -out
archive.csv -overwrite
y
```

OUTPUT

Varies depending upon which switch you use.

analyzer -archiveretrieve

Retrieves Analyzer archive files.

PREREQUISITES

You must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **naviseccli analyzer** command with the **-archiveretrieve** command lets you create the archive files on the SP, retrieve the archive files from the SP, and delete them from the SP.

analyzer -archiveretrieve is used with **naviseccli** (refer to naviseccli on page 35).

SYNTAX

```
analyzer  -archiveretrieve [-file filename] [-location pathname]
[-overwrite y|n] [-retry times]  [-v]
```

OPTIONS

-file *filename*

Specifies the name of the archive file once it is retrieved to the client.

-location *pathname*

Specifies the path location of the archive file once it is retrieved to the client system. If you do not specify a location, Analyzer uses the current working directory.

-overwrite y|n

Specifies whether to overwrite an existing archive file on the client system. If the specified archive file already exists and this switch is not used, the command fails.

y = Overwrite existing file.

n = Do not overwrite existing file.

-retry *times*

Specifies the number of times to retry a retrieve before giving up completely. A retry occurs only when the actual move of the archive file from the system to the client system fails.

-v

As the retrieve process progresses, the status of each stage appears.

EXAMPLE

This command retrieves an archive to the file `archive.nar` in `c:\Temp`, overwrites the existing file and retries three times.

```
naviseccli -h  ss1_spa -user username -password password
-scope scope-code analyzer -archiveretrieve -file archive.nar
-location c:\Temp\ -overwrite y -retry 3
```

analyzer -archivemerge

Merges Analyzer archive files.

PREREQUISITES

The host, username/password and scope options of **naviseccli** are ignored since this command runs locally.

DESCRIPTION

The **naviseccli analyzer** command with the **-archivemerge** command lets you merge two archives from the same SP into a single archive.

Note: The **-archivemerge** command recognizes and reports an error message when you try to open an encrypted archive file.

analyzer -archivemerge is used with **naviseccli** (refer to naviseccli on page 35).

SYNTAX

analyzer -archivemerge -data *archive1 archive2* [**-out** *outputarchive*] [**-overwrite y** |**n**]

OPTIONS

-data *archive1 archive2*

Merges the data of two archive files that you specify.

-out *outputarchive*

Specifies an output file to which to write the merged archive. Use quotation marks around the filename if it has spaces. If you do not specify this switch, the output merged file will be in the current directory with the default name (DD_MM_YY_HH_MM_merged.nar).

-overwrite y|**n**

Specifies whether to overwrite an existing archive file on the client system.

y = Overwrite existing file

n = Do not overwrite existing file

Note: If you try to overwrite a read-only file, an error message appears.

EXAMPLE

This command merges the files `C:\Temp\archive1.nar` and `C:\Temp\archive2.nar` and writes the merged archive in `C:\Temp\mergedArchive.nar`.

```
naviseccli analyzer -archivemerge -data C:\Temp\archive1.nar
C:\Temp\archive2.nar -out C:\Temp\mergedArchive.nar
```

9

EMC VNX MirrorView/A CLI

This chapter introduces the EMC® VNX MirrorView™/Asynchronous software and the EMC Navisphere® system management configurations and architecture.

This manual refers to the EMC VNX MirrorView/Asynchronous product as MirrorView/A.

Note: If you already familiar with MirrorView/A, you can skip to the next section.

Major topics are:

MirrorView/A overview

EMC® VNX™ MirrorView™/A lets you periodically update a remote copy of production data. It is a software application that keeps a point-in-time copy of a logical unit number (LUN) and periodically replicates the copy to a separate location in order to provide disaster recovery, that is, to let one image continue to be active if a serious accident or natural disaster disables the other. It can provide data replication over long distances (hundreds to thousands of miles). To provide for disaster recovery, the primary and secondary systems should be geographically separated. MirrorView/A ensures that data from the primary system replicates to the secondary. You can configure MirrorView/A over Fibre Channel and iSCSI, but not over Fibre Channel over Ethernet (FCoE).

The production image (the one mirrored) is called the primary image; the copy image is called the secondary image. MirrorView/A supports one remote image per primary. The primary image receives I/O from a server called the production server; a separate system maintains the secondary image. This system can optionally have a failover/standby computer connected to it or can be connected to its own computer system. Both systems can be in different domains, which you manage with the user interface (UI). The client that is managing the system containing the primary images can fail over to the secondary image if the primary image becomes inaccessible. After initial synchronization, the remote site always has a consistent point-in-time copy of the primary data.

Important: As a system-based mirroring product, MirrorView/A does not flush server buffers before replicating the primary data. Therefore, the copy is a crash-consistent image of the primary data. You must verify data integrity of the secondary image before using it for disaster recovery. (The verification process varies by application type.)

MirrorView/A supports MirrorView/A consistency groups, which this manual refers to as *consistency groups*. A consistency group is a set of asynchronous mirrors whose secondary images need to be kept consistent with each other in order to be useful; that is, the data on the set of secondary images must have existed on the set of primary images previously. This allows an application to use the secondary images if the primary system fails.

Important: The primary images of mirrors in a MirrorView/A consistency group must reside on a single system, and the secondary images of the mirrors must reside on a single (but different) system. This contrasts with volumes in a Symmetrix® consistency group, which can reside on multiple systems.

Prerequisites

- You must have the MirrorView/A software installed and enabled on all AX4-5 series, CX4 series, CX3 series, and CX series systems you want to participate in a mirror. Configuration guidelines on page 718 provide more information on installing the software on the AX4-5 series, CX4 series, CX3 series and CX series systems.
- Data access control must be enabled.
- You must have Unisphere installed and enabled.
- SAN configurations must have qualified switches.
- WAN configurations must have qualified FC-to-IP devices.

Configuration guidelines

The following are configuration rules for MirrorView/A:

- Each mirror must have one primary image and zero or one secondary image. Any single system can have only one image of a mirror.
- A system can have concurrent mirroring connections to a maximum of four other systems. (Mirroring connections are common between synchronous and asynchronous mirrors.)
- The following table lists the configuration limits for the supported platforms.

Platform	CX4 series systems	CX700, CX3 model 40, CX3 model 80 systems	CX500, CX3 model 20 systems	AX4-5 series, CX3 model 10 systems
Primary or secondary mirror images per system	256	100	50	25

Note: A metaLUN is a single entity; therefore, it is counted as one of your images. For example, if a mirrored metaLUN is composed of five components, it is counted as one of your images, not five. These limits are independent of the limits for synchronous mirrors. (See the *EMC MirrorView/Synchronous Command Line Interface (CLI) Reference*.)

- To manage remote mirror configurations, the management workstation must have an IP connection to both the local and remote systems. The connection to the remote system should have an effective bandwidth of at least 128 Kb/second. The systems can be in different domains.
- MirrorView/A supports the new, larger LUNs that the EMC FLARE® operating environment supports. (See the FLARE release notes.)
- Navisphere version 6.29.00 contains thin support for MirrorView/A.
- You cannot combine thin LUNs from CX4 systems running FLARE version 04.29.000.5.xxx or later with pre-FLARE version 04.29.000.5.xxx traditional LUNs or with traditional LUNs from an uncommitted FLARE version 04.29.000.5.xxx. Therefore, you cannot mirror between LUNs created on systems running FLARE version 04.29.000.5.xxx and LUNs created on systems running pre-FLARE version 04.29.000.5.xxx.

Note: If your system will include FAST Cache (solid state disk drives with flash memory, or SSD drives), be sure to carefully plan your configuration using the *Best Practices and planning* documentation available on EMC Powerlink: Home ➤ Support ➤ Technical Documentation and Advisories ➤ White Papers > Configuration/Administration.

Sample configuration

Figure 8 on page 719 shows a sample remote mirror configuration using either iSCSI networks or Fibre Channel switch fabrics. The configuration has two sites and a primary and secondary image that includes the database of four LUNs.

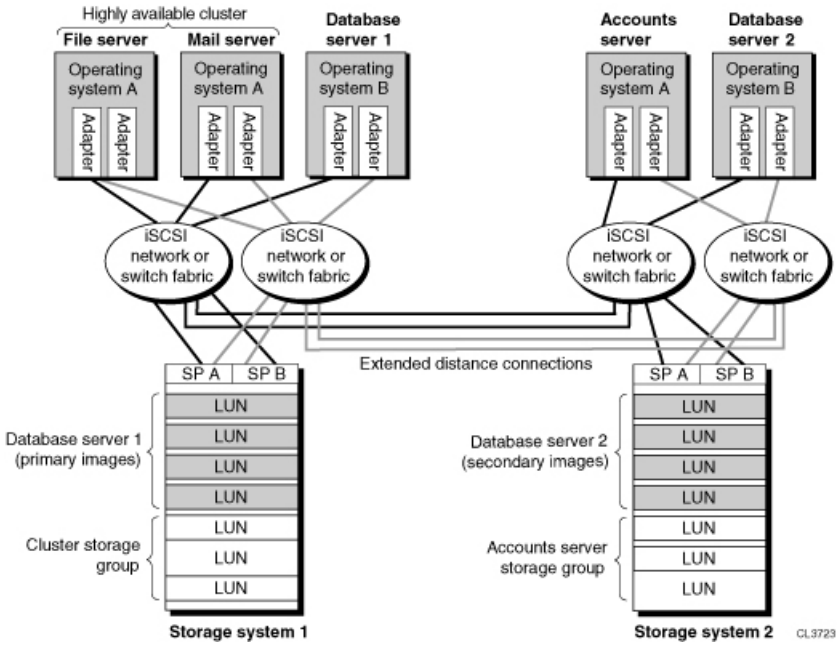


Figure 8. Sample remote mirror configuration

In the above figure, database server 1, which is the production server, executes customer applications. These applications access data on system 1, in the database server storage group. system 2 mirrors the data on the database server storage group.

Note: Storage groups are different from consistency groups, which are described in MirrorView/A consistency group commands on page 766. For more information about storage groups, see the Unisphere online help.

We recommend that you attach a secondary server to system 2, so that if a complete site failure occurs where system 1 and database server 1 are located, you can completely fail over to the secondary site, and thus minimize the outage window. The server at the standby site is not required, but because we recommend it, this example includes it in the overall configuration.

Each server has a path to each SP through each network or fabric to each system. If a failure occurs in a path, software installed on the server (for example, EMC PowerPath® software) switches to the path through the other SP and continues accessing the data, transparent to the applications on the server.

The production server sends a write request to an SP in system 1, which then writes data to the local LUN. The change to the primary LUN is recorded, and at an interval that you define, all changes are copied to the secondary system.

If a failure occurs in system 1, an administrator can use the client that is managing the system to promote the image on system 2 to the role of primary image.

Note: The mirrored data is inaccessible until the secondary image is promoted to a primary image.

Then, the appropriate applications can start on any connected server (here, database server 2) with full access to the data. The mirror can be accessible in minutes, although the time needed for applications to recover will vary.

MirrorView connection requirements

MirrorView requires the following:

- One server, connected to one of the systems (a second server, connected to the other system, is optional).
- A Fibre Channel connection (direct or switch) or an iSCSI connection between the two systems, shown on the following pages).

Note: The iSCSI connection is not supported on AX4-5 series systems with FLARE version 02.23.050.5.5xx.

Cable connections between SPs at the MirrorView sites

MirrorView uses a front-end port on each storage processor (SP) as a communication channel between the systems in a remote mirror configuration. This port is called the mirror port in this document.

Table 13 on page 805 shows the mirror ports for the CX4 series systems shipped from the factory without optional I/O modules. The MirrorView ports may vary depending on the type and number of I/O modules in the system. The *EMC Navisphere Command Line Interface (CLI) Reference* explains how to determine the ports available for MirrorView on systems shipped from the factory with optional I/O modules.

Note: For CX4 series systems, the port numbers listed are logical ports; therefore, these CX4 logical port numbers may not be the same as the physical port numbers that Navisphere displays.

Table 13. Mirror ports for the CX4 series systems shipped from the factory without optional I/O modules

System	MirrorView Fibre Channel FE ports		MirrorView iSCSI FE ports	
	Logical port ID	Physical slot and port number	Logical port ID	Physical slot and port number
CX4-120, CX4-240	A-1	slot A0 port 3	A-3	slot A1 port 1
	B-1	slot B0 port 3	B-3	slot B1 port 1
CX4-480, CX4-960	A-3	slot A1 port 3	A-5	slot A4 port 1
	B-3	slot B1 port 3	B-5	slot B4 port 1

Table 14 on page 806 shows the mirror ports for systems other than the CX4 series systems. All port numbers referenced are front-end ports.

Table 14. Mirror ports for systems other than the CX4 series systems

Model	Fibre Channel MirrorView port	iSCSI MirrorView port
CX500	1	N/A
CX700	3	N/A
CX3-10c	3	1[a]
CX3-20, CX3-20f, CX3-40, CX3-40f	1	N/A
CX3-20c, CX3-40c	5	3[a]
CX3-80	3	N/A

Note: For information about determining what your MirrorView port is, see the *EMC Navisphere Command Line Interface (CLI) Reference*.

Although server I/O can share the front-end port with MirrorView, for performance reasons, we strongly recommend that server I/O use the front-end ports that MirrorView is not using.

CAUTION Currently, MirrorView and SAN Copy™ software cannot share the same SP port. Before installing the MirrorView enabler, you must deselect any MirrorView ports that a SAN Copy session is using. Otherwise, any SAN Copy sessions using the MirrorView port will fail.

For MirrorView to work correctly, the SP A mirror port at one site must be connected to the SP A mirror port on the other site and the SP B mirror port at one site must be connected to the SP B mirror port at the other site. The connections can be either direct or through a switch fabric.

Direct remote mirror connections

A direct mirror configuration consists of one primary system and one secondary system. The remote mirror connections must be between:

- SP A mirror ports on the primary and secondary systems
- SP B mirror ports on the primary and secondary systems

Figure 9 on page 807 shows a sample direct remote mirror configuration.

[a] Mirroring over iSCSI is supported for FLARE version 03.26.xxx.5.xxx or later.

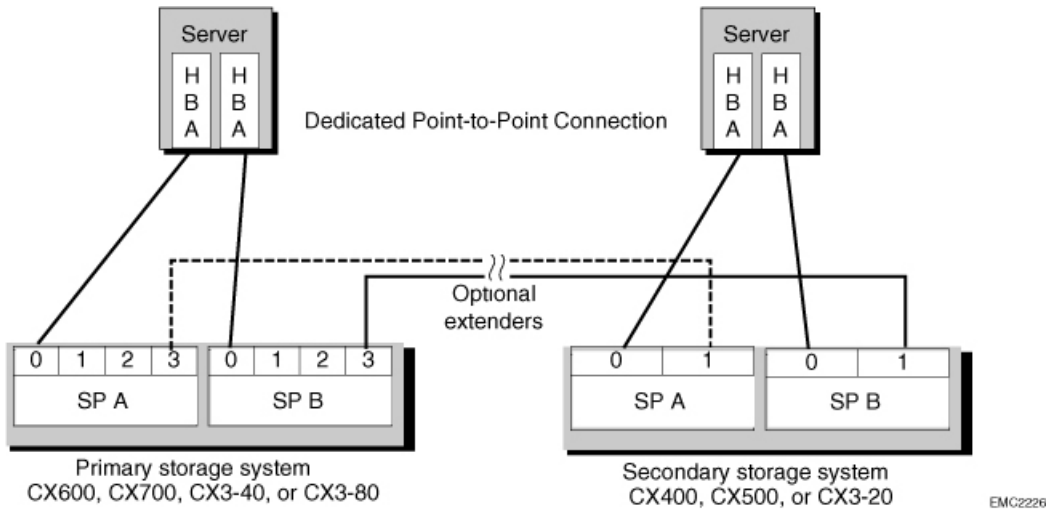


Figure 9. Sample direct remote mirror configuration

Fabric remote mirror connections

A fabric mirror configuration consists of one primary system and up to four secondary systems. The fabric connections must be as follows:

- SP A mirror port on the primary system must be connected to the same switch fabric as the SP A mirror port on the secondary system.
- SP B mirror port on the primary system must be connected to the same switch fabric as the SP B mirror port on the secondary system.

Note: The fabric to which SP A mirror ports are connected can be the same fabric or a different fabric than the one to which the SP B mirror ports are connected.

You must zone the mirror port switch connections as follows:

- A zone for each SP A mirror port on the primary system and the SP A mirror port on each secondary system.
- A second zone for each SP B mirror port on the primary system and the SP B mirror port on each secondary system.

For example, if you have primary system 1 and secondary systems 2 and 3, you need the following two zones:

- Zone 1—SP A mirror port on system 1 and SP A mirror ports on systems 2 and 3.
- Zone 2—SP B mirror port on system 1 and SP B mirror ports on systems 2 and 3.

You can use the same SP port for server data and MirrorView. Be careful when an IP distance connection is used because using the same SP port may cause a degradation in both replication and server application performance.

CAUTION MirrorView and SAN Copy software cannot share the same SP port. Before installing the MirrorView enabler, you must deselect any MirrorView ports that a SAN Copy session is using. Otherwise, any SAN Copy sessions using the MirrorView port will fail.

Figure 10 on page 808 shows a sample remote mirror fabric configuration.

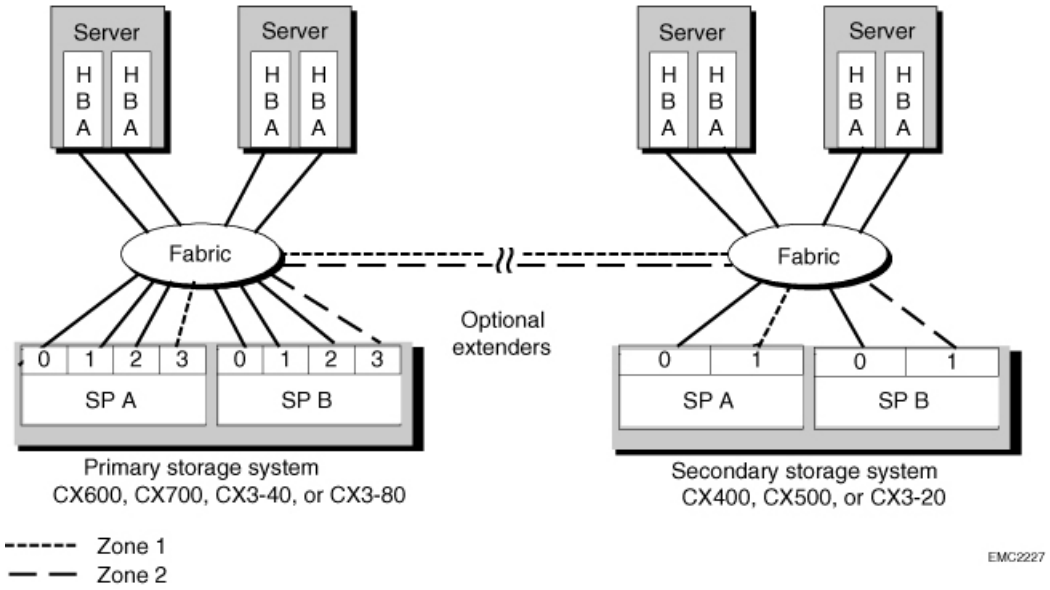


Figure 10. Sample remote mirror connection through a fabric

MirrorView features and benefits

MirrorView mirroring has the following features:

- Provision for disaster recovery with minimal overhead
- MirrorView® environment
- Bidirectional mirroring
- Integration with EMC SnapView™ LUN copy software
- Integration with EMC SAN Copy software
- Replication over long distances
- Application integration

Provision for disaster recovery with minimal overhead

Provision for disaster recovery is the major benefit of MirrorView mirroring. Destruction of the data at the primary site would cripple or ruin many organizations. After a disaster, MirrorView lets data processing operations resume with minimal overhead. MirrorView enables a quicker recovery by creating and maintaining a copy of the data on another system.

MirrorView is transparent to servers and their applications. Server applications do not know that a LUN is mirrored and the effect on performance is minimal.

With MirrorView/A, secondary systems are periodically updated, based on the user-defined update frequency.

MirrorView is not server-based; therefore, it uses no server I/O or CPU resources. The additional processing for mirroring is performed on the system.

MirrorView environment

MirrorView operates in a highly available environment, leveraging the dual-SP design of systems. If one SP fails, MirrorView running on the other SP will control and maintain the mirrored LUNs. If the server is able to fail over I/O to the remaining SP, then periodic updates will continue. The high-availability features of RAID protect against disk failure, and mirrors are resilient to an SP failure in the primary or secondary system.

Bidirectional mirroring

A single system may be primary (that is, hold the primary image) for some mirrors and secondary (that is, hold the secondary image) for others. This enables bidirectional mirroring.

Note: A system can never hold more than one image of a single mirror; that is, it cannot contain both the primary image and secondary image of a single mirror.

Integration with EMC SnapView software

SnapView software lets you create a snapshot of an active LUN at any point in time. The snapshot is a consistent image that can serve for other application purposes while I/O continues to the source LUN. The secondary image is not viewable to any servers, but you can use SnapView in conjunction with MirrorView/A to create a snapshot of a secondary image on a secondary system to perform data verification and run parallel processes.

Note: Before taking a snapshot, make sure that the secondary LUN is in a normal condition or fractured, and is not updating. A snapshot of a secondary LUN when MirrorView/A is updating the secondary system will not give consistent data. Also, note that data cached on the server, as well as data written to the primary system but waiting to be transferred to the secondary system on the next update, will not be included in a snapshot of the secondary image.

You can clone either a primary or secondary image by creating a clone group on the same LUN as the mirror image and then adding clones to the group. For more information about using SnapView with MirrorView, see the Unisphere online help.

Note: Before fracturing a clone or starting a SnapView session, make sure that the secondary image is in the synchronized or consistent state. Fracturing a clone or starting a SnapView session of a secondary LUN when MirrorView/A is synchronizing the secondary system will not give consistent data. Also, note that data cached on the server, as well as data written to the primary system but waiting to be transferred to the secondary system on the next update, will not be included in the replica of the secondary image.

The server (if any) connected to the secondary system might sit idle until the primary site fails. With SnapView at the secondary site, the server at the secondary site can take snapshots of the mirror images and back them up to other media. This provides point-in-time snapshots of production data with little impact to production server performance.

Integration with EMC SAN Copy software

SAN Copy software lets you create an intra- or inter-system copy of a LUN at any point in time. However, do this only when the image state is either Synchronized or Consistent and the mirror is not updating to the secondary image. The copy is a consistent image that can serve for other application purposes while I/O continues to the source LUN. The MirrorView secondary image is not viewable to any servers, but you can use SAN Copy to create a copy of the secondary image on a secondary system to perform data verification and run parallel processes.

Note: Related to the process of making the MirrorView secondary unavailable for server I/O, you cannot run SAN Copy full copy sessions on MirrorView secondary images. You can, however, run SAN Copy incremental sessions on MirrorView secondary images.

For more information about SAN Copy, see the Unisphere online help.

Replication over long distances

MirrorView/A uses FC-to-IP devices to provide replication over long distances (hundreds to thousands of miles).

Application integration

Using the Navisphere commands, you can script application integration. You can do this by setting the mirror to the manual update type and issuing a syncimage command from the CLI. To ensure that the application data is in a consistent state, put the application (for example, a database) in backup mode, make sure any data buffered on the server is flushed to the system, and issue the MirrorView/A **`syncimage`** command. After the update has started, you can resume the application activities. These application integration processes allow MirrorView/A to generate a secondary that has a consistent state image of the primary and, thus you can readily use it for backup or application testing.

MirrorView/A remote mirroring commands

This section explains the **naviseccli** commands and the commands for creating and managing remote mirrors on AX4-5 series, CX4 series, CX3 series, and CX series systems with the MirrorView/A option. These commands let you use MirrorView/A software to create a byte-for-byte copy of one or more local LUNs connected to a distant system server.

Note: The commands in this section function only with a system that has the optional MirrorView/A software installed.

MirrorView/A operations overview

This section provides an overview of MirrorView/A operations and how to manage the systems using the management software.

1. Connect the same management software to both systems and configure the software, so that you can manage both systems.

   Note: Optionally, you can perform this step at the secondary site as well.

   You must manage both systems, which can be in different domains (see the Unisphere online help).

2. Estimate the size of the reserved LUN pool and the reserved LUNs (see the *EMC Navisphere Command Line Interface (CLI) Reference*).

3. Establish a usable, two-way connection between the MirrorView/A systems using the **mirror -enablepath** command (see mirror -enablepath on page 748).

4. If the primary LUN does not exist, bind it on its server's system. Wait for the LUN to finish binding and add it to the storage group.

5. If the secondary LUN does not exist, create a secondary image LUN.

   Note: The secondary LUN can be a different RAID type from the primary, as long as the block size matches.

6. Wait for the secondary LUN to finish binding.

7. From the management workstation, create the remote mirror (see mirror -async -create on page 742).

Next add a secondary image. To add a secondary image, see mirror -async -addimage on page 733.

Normally, when you add a secondary image to a mirror, the software synchronizes the secondary image with the primary image .

The software will initially copy all the data from the primary LUN to the secondary LUN, in order to ensure that the two LUNs are identical.

At any time in the previous sequence of steps, you can get remote mirror status with the **`mirror -async -list`** command.

8. Create a consistency group and add the primary image to it (optional). See mirror -async -creategroup on page 767.

9. If a primary failure occurs, Navisphere reports the failure.

   If the primary failure is minor, have the primary fixed and resume mirroring.

   If the primary failure is catastrophic, the original client that is managing the system may be unusable and thus unable to report the failure. For such a failure, the administrator at the secondary site must set up a client to manage the system (if not already done), then promote the secondary to primary and take other recovery action as needed. This includes assigning the newly promoted LUN to a storage group, if it is not already the appropriate one.

   When you use MirrorView/A on a VMware ESX Server, after you promote the secondary image to a primary image, perform the following steps:

   a. If not already assigned, assign the newly promoted primary image to a storage group on the same or standby ESX Server.

   b. Rescan the bus at the ESX Server level.

   c. If not already created, create a virtual machine (VM) on the same or standby ESX Server. The VM is not powered up when you create it.

   d. Assign the newly promoted primary to the VM.

   e. Power up the VM.

   If the VM is created and running and you have not already assigned the newly promoted primary to the VM, perform these steps:

   a. Perform steps a and b above.

   b. If you are running ESX Server 2.5.x, power it down.

   c. To assign the newly promoted primary to the VM, use the virtual center interface for ESX Server 3.x and 2.5.x or the Management User interface for ESX Server 2.5.x.

   Note: If you are running ESX Server 3.x, you do not need to power down the VM.

   ---

d. If you are running ESX Server 2.5.x, power up the VM.

Note: If you are running ESX Server 3.x, you do not need to power up the VM.

The primary image (which is now the secondary image) will not be accessible to the primary ESX Server.

Note: For configuration restrictions when using VMFS volumes, go to the E-Lab™ Navigator on the EMC Powerlink website, and under the PDFs and Guides tab, open the `VMware ESX server.pdf` file.

10. If access to the secondary storage image fails, the primary system will fracture the remote mirror. If the problem with the secondary is minor (for example, replacing a cable), then the administrator can fix it. Mirroring will recover and resynchronize the image, if the image recovery policy is Automatic.

    Whenever you want to stop mirroring, you can first fracture and remove the secondary images, and then destroy the mirror. This does not affect any data on either image LUN, and access to the primary LUN is also unaffected. The LUN that held the secondary image now becomes accessible as a regular LUN.

MirrorView/A CLI functions

The Navisphere CLI provides one of the two interfaces to the MirrorView/A mirroring software. The Unisphere UI provides the other.

You can use the naviseccli mirror CLI command to set up and manage remote mirror sessions.

The naviseccli mirror command functions are summarized in Table 15 on page 731.

Table 15. naviseccli MirrorView/A command functions

Essential functions (in order performed)	
`mirror -enablepath`	Opens a path between the local and remote system. Required regardless of the type of connection between systems.
`mirror -async -create`	Creates a new remote mirror using an existing LUN. The LUN on which the -create command is executed becomes the primary image.
`mirror -async -addimage`	Adds a secondary image to a mirror using a LUN on a remote system. The default is to synchronize unless you specify otherwise.
`mirror -async -changeimage`	Changes secondary image properties such as auto recovery setting and recovery policy.
`mirror -async -fractureimage`	Fractures a secondary image, suspending mirroring of data to that image. A fracture log is maintained, so that the image can be quickly resynchronized later.
`mirror -async -removeimage`	Removes a secondary image from a mirror.
`mirror -async -promoteimage`	Promotes a secondary image to primary, while simultaneously demoting the primary image (if still accessible) to secondary. Required in order to access the data in the secondary image in the event of a failure of the primary.

Table 15. naviseccli MirrorView/A command functions *(continued)*

Essential functions (in order performed)	
`mirror -async -syncimage`	Starts synchronization of the secondary image with the primary. Needed if automatic recovery is not on. I/O is allowed with the primary while synchronization occurs. You can specify a synchronization rate to avoid serious performance impact.
`mirror -async -info`	Displays MirrorView/A information about a system.
`mirror -async -list`	Displays information on existing mirrors.

Optional reconfiguration functions (alphabetically)	
`mirror -async -change`	Changes remote mirror properties.
`mirror -async -destroy`	Terminates remote mirroring of a LUN. This does not affect the data in the LUN, and the server continues to access it.
`mirror -disablepath`	Severs all paths between the local system SPs and the remote system SPs.

mirror -async -addimage

Adds an image to a previously created mirror.

PREREQUISITES

You must have a user account on the system on which you want to execute the command.

DESCRIPTION

This command is used with **naviseccli** (see naviseccli on page 35) to add a secondary image to a mirror using a LUN on a remote system. The **-addimage** function is required if you want mirroring to occur. You must direct the command to the system that holds the primary image. This command lets you create primary and secondary images on thin LUNs, if all the participating systems support mirroring on thin LUNs.

Note: The Thin Provisioning™ enabler must be installed to create thin LUNs.

You can use the **-info** function to display the UIDs of systems that have images that can be mirrored.

Note: To add a secondary image, you must have a working connection to the remote system, and the remote LUN must be exactly the same size (number of blocks) as the primary image.

Note: In this syntax "or" means that you can specify the switch, **-arrayhost** *sp-hostname* | **sp-IP-address -lun** *lun-number* | **-lunuid** *lun-uid* or you can specify the switch, **-arrayuid** *system-uid* **-lunuid** *lun-uid*. The rest of the syntax is common to both.

SYNTAX

```
mirror -async -addimage -name  name | -mirroruid mirroruid
-arrayhost sp-hostname|sp-IP-address
-lun lun-number | -lunuid lun-uid
```

or

```
mirror -async -addimage -name  name | -mirroruid mirroruid
-arrayuid system-uid -lunuid lun-uid
[-recoverypolicy auto|manual]
[-syncrate high|medium|low]
[-manualupdate |-delaystart time | -enddelay time]
[-nosyncrequired]
```

OPTIONS

-name *name*

Specifies the name that you gave to the mirror with the **-create** command.

-mirroruid *uid*

Specifies the unique 16-byte primary image ID (World Wide Name) the software assigned when the mirror was created. For any letters in the ID, you must specify the same case as the software assigned when the mirror was created (use the mirror -async -list on page 755 function).

-arrayhost *sp-hostname* | *sp-IP-address*

Specifies the hostname or network address of the remote SP that will hold the secondary image. The secondary image will be added to the remote mirror connected to this host's SP. Use this switch or **-arrayuid**.

-lun *lun-number*

Specifies the LUN number that will serve as the secondary image of the mirror.

-arrayuid *system-uid*

Specifies the unique 8-byte system ID of the remote SP. You can determine this by using the **mirror -info** command or the **getarrayuid** command (see the *EMC Navisphere Command Line Interface (CLI) Reference*). For any letters in the ID, use the same case that the software assigned when the mirror was created. Use this switch or **-arrayhost**.

-lunuid *lun-uid*

Specifies the unique 16-byte identification number (World Wide Name) of the LUN to be added as a secondary image. If you specified **-arrayuid**, then **-lunuid** is required. If you specified **-arrayhost** , then you can use either **-lun** or **-lunuid**.

Note: When you specify **-arrayuid** and **-lunuid**, you must add the mirror driver on the remote LUN using the **-setfeature** command before executing the **-addimage** command.

-recoverypolicy manual|**auto**

Specifies the policy for recovering the secondary mirror image after a system fracture. Values are:

manual: The administrator must explicitly start a synchronization operation to recover the secondary mirror image.

auto: Recovery automatically resumes as soon as the primary image determines that the secondary mirror image is once again accessible. This is the default.

-syncrate high|medium|low

Specifies a relative value (low, medium, or high) for the priority of completing updates. High completes updates faster, but may significantly affect system performance for server I/O requests, particularly where there are multiple concurrent synchronizations occurring. Low completes updates much slower, but also minimizes impact on other system operations.

-manualupdate

Indicates that you must explicitly update the image.

-delaystart *time*

Specifies the time (in minutes) from the beginning of the previous update to the start of the next update. The current update must complete before the next one can start. If the update is still in process when the time period expires, the next update will start immediately once the current update completes.

-enddelay *time*

Specifies the time (in minutes) from the end of the previous update to the next update. A value of 0 causes updates to occur as fast as possible.

-nosyncrequired

Specifies that the image will be added in a synchronized state; thus, no initial synchronization will occur.

EXAMPLE

Any of the following commands adds an image to a mirror. Note that if you specify the remote system using the **-arrayuid** switch, before issuing the command you must explicitly add drivers to the LUN stack using the **-setfeature** command. For SP `ss1_spa`, any of the above commands adds to the remote mirror **db_mirror** the LUN in system **50:06:06:10:00:FD:A1:69** (or a LUN on the remote system cpc426) whose unique LUN ID (world wide name, WWN) is **60:06:06:5A:62:02:00:00:92:95:DE:7C:E4:71:D4:11** or whose LUN number is **9**. See also the example in mirror -async -create on page 742.

```
naviseccli -h ss1_spa mirror -async -addimage
-name db_mirror -arrayuid 50:06:06:10:00:FD:A1:69
-lunuid 60:06:06:5A:62:02:00:00:92:95:DE:7C:E4:71:D4:11

naviseccli -h ss1_spa mirror -async -addimage
-name db_mirror -arrayhost cpc426  -lun 9

naviseccli -h ss1_spa mirror -async -addimage
 -name  db_mirror -arrayhost cpc426
-lunuid 60:06:06:5A:62:02:00:00:92:95:DE:7C:E4:71:D4:11
```

OUTPUT

If the version of FLARE software running on the SP does not support this command, a `Command is not supported` error message is printed to `stdout`. You may also receive other error messages.

mirror -async -change

Changes mirror properties.

PREREQUISITES

You must have a user account on the system on which you want to execute the command.

DESCRIPTION

This command is used with **naviseccli** (see naviseccli) to change one or more parameters of a previously created mirror.

You must direct the command to the system that holds the primary image. You must specify at least one of the optional switches with this command. If you omit the override option, then the CLI displays a message for each parameter to confirm the change.

SYNTAX

```
mirror -async -change -name name | -mirroruid uid
[-description description]
[-requiredimages num_of_images] [-o]
[-enablereadonlysecondary yes|no]
```

OPTIONS

-name *name*

Specifies the name the **-create** command gave the mirror. You can specify either the mirror name or unique ID (next).

-mirroruid *uid*

Specifies the unique 16-byte remote mirror ID assigned when the mirror was created. For any letters in the ID, you must specify the same case as the software assigned when the mirror was created (use the **mirror -list** command).

-description *description*

Provides a meaningful title for the mirror (for example, Employee and Benefits Table for Human Resources). The software does not use the description to identify the mirror. You can specify up to 256 characters, but we suggest that you should not exceed the line length defined by the operating system.

-requiredimages *num_of_images*

Specifies the minimum number of secondary images that should be accessible to the mirror. The default value is 0. Allowed values are 0, 1, and all. If the number of accessible images goes below the specified value, the mirror goes into the Attention state and generates a log message. You can configure this to generate an appropriate warning (for example, e-mail message or page) to the administrator to enable the administrator to correct the problem.

-o

Executes the command without prompting for confirmation.

EXAMPLE

For the remote mirror **dbmirror** on SP **ss0_spa**, this command reduces the minimum number of accessible secondary images to **0**. Use the **-list** command to confirm that the changes were made.

```
naviseccli -h ss0_spa mirror -async -change -name
dbmirror -requiredimages 0
```

OUTPUT

If the version of FLARE software running on the SP does not support this command, a `Command is not supported` error message is printed to `stdout`. You may also receive other error messages.

mirror -async -changeimage

Changes secondary image properties.

PREREQUISITES

You must have a user account on the system on which you want to execute the command.

DESCRIPTION

This command is used with **naviseccli** (see naviseccli) to change one or more parameters of a mirror image.

You must direct the command to the system that holds the primary image. You must specify at least one of the optional switches. If you omit the override option, then it displays a message similar to the following for each parameter to confirm the change.

```
Do you want to change the sync rate from Medium to High (y/n)?
```

To change a parameter, enter `y`.

SYNTAX

```
mirror -async -changeimage -name  name | -mirroruid uid
-imageuid image-uid
[-recoverypolicy manual|auto]
[[-manualupdate] | [-delaystart time]]
[-enddelay time]
[-syncrate high|medium|low] [-o]
```

OPTIONS

-name *name*

Specifies the name you gave to the remote mirror in the **-create** command. You can specify either the mirror name or uid (next).

-mirroruid *uid*

Specifies the unique 16-byte ID assigned when the mirror was created. For any letters in the ID, you must specify the same case as the software assigned when the mirror was created (use the **mirror -list** command).

-imageuid *image-uid*

Specifies the unique 8-byte ID of the secondary image you want to change. For any letters in the ID, you must specify the same case that the software assigned to the image when the mirror was created (use the **mirror -list** command).

-recoverypolicy manual|auto

Specifies the policy for recovering the secondary mirror image after a system fracture. Values are:

manual: The administrator must explicitly start a synchronization operation to recover the secondary mirror image.

auto: Recovery automatically resumes as soon as the primary image determines that the secondary mirror image is once again accessible. This is the default.

-manualupdate

Indicates that you must explicitly update the image.

-delaystart *time*

Specifies the time (in minutes) from the beginning of the previous update to the start of the next update. The current update must complete before the next one can start. If the update is still in process when the time period expires, the next update will start immediately once the current update completes.

-enddelay *time*

Specifies the time (in minutes) from the end of the previous update to the next update. A value of 0 causes updates to occur as fast as possible.

-syncrate high|medium|low

Specifies a relative value (low, medium, or high) for the priority of completing updates. High completes updates faster, but may significantly affect system performance for server I/O requests, particularly where there are multiple concurrent synchronizations occurring. Low completes updates much slower, but also minimizes impact on other system operations.

-o

Executes the command without prompting for confirmation.

EXAMPLE

For system `server1`, mirror **db_mirror**, image **50:06:06:10:00:FD:A1:6**, this command changes the synchronization rate to high. Use the **-list** command to confirm that the changes were made.

```
naviseccli -h server1 mirror -async -changeimage  -name
db_mirror -imageuid 50:06:06:10:00:FD:A1:6 -syncrate high
```

OUTPUT

If the version of FLARE software running on the SP does not support this command, a `Command is not supported` error message is printed to `stdout`. You may also receive other error messages.

mirror -async -create

Creates a new asynchronous mirror using an available LUN for mirroring.

PREREQUISITES

You must have a user account on the system on which you want to execute the command.

DESCRIPTION

This command is used with **naviseccli** to create a new mirror using an existing LUN. The LUN on which you run the command becomes the primary LUN. But, for mirroring to occur, you must add an image with the **-addimage** function. Later, you can change some of the parameters you specify here with the **-change** function. This command supports thin LUNs after you install the latest Navisphere version, which contains thin LUN support for MirrorView.

If you specify a minimum number of required images (other than the default value zero) in the **-create** command, the mirror will start in the attention state, since you have not yet added the required secondary images. To avoid this problem, do not specify a minimum number of images with **-create**; instead, create the mirror, add the image, and then if you want a minimum number of required images, change the mirror with the **-change** command.

SYNTAX

```
mirror -async -create -name  name
-lun lun_number
[-description description]
[-requiredimages  num_of_images]
[-o]
```

OPTIONS

-name *name*

Lets you assign a meaningful name to the mirror; for example `"Employee Benefits"`. To include spaces in the name, enclose the entire string in quotation marks as in the example. You can use this name to manage the mirror. The name can include as many as 35 characters.

-lun *lun_number*

Specifies the LUN number that will serve as the primary image of the mirror you are creating.

-description *description*

Lets you assign a description for the mirror. The software does not use the description to identify the mirror. You can specify up to 256 characters, but we suggest that you should not exceed the line length defined by the operating system.

-requiredimages *num_of_images*

Specifies the minimum number of secondary images that should be accessible to this mirror. The default value is 0. Allowed values are 0, 1 and all. If the number of accessible images goes below the specified value, the mirror goes into the Attention state and generates a log message. You can configure this to generate an appropriate warning (for example, e-mail message or page) to the administrator to enable the administrator to correct the problem.

-o

Executes the command without prompting for confirmation.

EXAMPLE

The mirror **-async -create** command creates the mirror named **db_mirror** on LUN **112**. The mirror automatically activates.

```
naviseccli -h ss1_spa mirror -async -create -name db_mirror -lun 112
```

OUTPUT

If the version of FLARE software running on the SP does not support this command, a `Command is not supported` error message is printed to `stdout`. You may also receive other error messages.

mirror -async -destroy

Destroys a mirror.

PREREQUISITES

You must have a user account on the system on which you want to execute the command.

DESCRIPTION

This command is used with **naviseccli** (see naviseccli) to destroy a mirror. It is the counterpart of **-create**. It ends mirroring of the LUN that is part of the mirror. This does not affect the data in the LUN, and the server continues to access it.

Note: You cannot destroy a mirror while it is a member of a consistency group.

You must remove the secondary image in the mirror before issuing the command to the system holding the primary image. If you cannot remove the secondary image or access the primary image, you can use the **-force** option. You must direct the command to the system that holds the primary image unless **-force** is specified, in which case, you can direct it to either system.

CAUTION Use **-force** only if all other options to remove an image and the mirror have failed.

If you omit the override option, a message to confirm the destruction of the mirror appears:

```
Do you really want to destroy the mirror <mirror-name> (y/n)?
```

To destroy the mirror, answer `y`; to take no action, enter `n`.

SYNTAX

```
mirror -async -destroy -name  name | -mirroruid uid
[-force] [-o]
```

OPTIONS

-name *name*

Specifies the name you gave to the mirror with the **-create** command. You can also use the remote mirror ID.

-mirroruid *uid*

Specifies the unique 16-byte remote mirror ID assigned when the mirror was created. For any letters in the ID, you must specify the same case as the software assigned when the mirror was created (use the **mirror -list** command).

-force

Forcibly destroys the mirror. This option affects only the local system.

-o

Executes the command without prompting for confirmation.

EXAMPLE

For SP **ss1_spa**, this command destroys the remote mirror that was created with the name db_mirror.

```
naviseccli -h ss1_spa mirror -async -destroy db_mirror

Do you really want to destroy the mirror
db_mirror?(y/n)? y
```

OUTPUT

If the version of FLARE software running on the SP does not support this command, a `Command is not supported` error message is printed to `stdout`. You may also receive other error messages if the command fails for some reason.

mirror -disablepath

Disables the communication paths created by **-enablepath** to remote mirror SPs.

PREREQUISITES

You must have a user account on the system on which you want to execute the command.

DESCRIPTION

Use this command with **naviseccli** (see naviseccli on page 35) to sever the path established by **-enablepath** in the remote system.

When issued to any SP, the command severs paths for both SPs in both the primary and secondary systems; that is, it severs these paths if:

- SP A of the local system is connected to SP A of the remote system
- SP A of the remote system is connected to SP A of the local system
- SP B of the local system is connected to SP B of the remote system
- SP B of the remote system is connected to SP B of the local system

This means you can issue the command to either SP of either system to sever the paths between the systems you are targeting.

If you issue the command while a mirror exists, the CLI issues a warning message; if you continue, any mirror connected over the specified path will be fractured.

Note: If both asynchronous and synchronous mirrors are installed, you need to run the command only once. It will take effect for both mirrors.

If you omit the override option, the CLI displays a message to confirm the disabling of the path. To disable the path, answer `y`; to take no action, enter `n`.

SYNTAX

mirror -disablepath *connected-SP-hostname* [**-connectiontype fibre**|**iscsi**] [**-o**]

OPTIONS

connected-SP-hostname

Specifies the hostname of SP A or SP B of a connected system to disconnect.

-connectiontype fibre | iscsi

Specifies the connection type as fibre or iSCSI for the path you are disabling. If you do not specify the **-connectiontype** switch, the system first tries to find a fibre connection; if it does not find one, it looks for an iSCSI connection.

-o

Executes the command without prompting for confirmation. Without this switch, the CLI displays a confirmation message for each SP.

EXAMPLE # 1

For SP **ss1_spa**, this command and confirmation remove the paths between the local SPs and the remote mirror SPs.

```
naviseccli -h ss1_spa mirror -disablepath ss27_spa -connectiontype fibre

Disabling of the path will stop mirroring of data to all

images if any among these arrays. A system fracture of

all mirrors between two arrays on following storage

processors will occur due to this action.

128.221.39.29

10.14.20.154

Do you want to continue (y/n)? y
```

EXAMPLE # 2

The **mirror -info** command displays the updated status.

```
naviseccli -h ss1_spa mirror -async -info
```

OUTPUT

If the version of FLARE software running on the SP does not support this command, a `Command is not supported` error message is printed to `stdout`.

mirror -enablepath

Establishes a path for remote mirroring between a local and remote system.

PREREQUISITES

You must have a user account on the system on which you want to execute the command.

DESCRIPTION

This command is used with **naviseccli** (see naviseccli on page 35) to create a path between the specified SP and its peer SP to a remote SP and its peer. These paths will serve as paths for remote mirroring. A remote mirror requires a path between the primary and secondary systems.

When issued to any SP, the command creates paths for both SPs in both systems; that is, it creates these paths:

- SP A of the local system to SP A of the other system
- SP A of the other system to SP A of the local system
- SP B of the local system to SP B of the other system
- SP B of the other system to SP B of the local system

The SP As or the SP Bs in both systems must be physically connected.

If you cannot enable paths on one SP due to some error, an informational message appears and the paths are enabled for the other SP. To obtain status information, run the **mirror -info -systems** command.

Note: If both asynchronous and synchronous mirrors are installed, you will need to run the command only once. It will take effect for both mirrors.

SYNTAX

mirror -enablepath *SP-hostname* [**-connectiontype fibre**|**iscsi**]

OPTIONS

SP-hostname

Specifies the hostname of SP A or SP B of the remote system on which you want to enable remote mirroring.

-connectiontype fibre | iscsi

Specifies the connection type as fibre or iSCSI for the path you are enabling. If you do not specify the **-connectiontype** switch, the system first tries to find a fibre connection; if it does not find one, it looks for an iSCSI connection.

Note: To change the connection type, you must first disable the current enabled path. To modify, test, or delete connections or change the credentials, see the *EMC Navisphere Command Line Interface (CLI) Reference.*

EXAMPLE

For SP **ss1_spa**, this command enables the paths between **ss1_spa** and its peer SP and **ss27_spa** and its peer SP. The **mirror -info** command that follows displays the updated status.

```
naviseccli -h ss1_spa mirror -enablepath ss27_spa -connectiontype
iscsi

naviseccli -h ss1_spa mirror -async -info
```

OUTPUT

If the version of FLARE software running on the SP does not support this command, a `Command is not supported` error message is printed to stdout.

mirror -async -fractureimage

Fractures an image in a mirror.

PREREQUISITES

You must have a user account on the system on which you want to execute the command.

DESCRIPTION

This command is used with **naviseccli** to start an administrative fracture of a secondary image. It also prevents scheduled updates from starting in the future. You must direct the command to the system that holds the primary image.

(An automatic fracture, called a system fracture, occurs if a secondary image becomes inaccessible to the primary image. After a system fracture, the system periodically tries to communicate with the secondary image and — if it succeeds — starts synchronization based on the fracture log. If you issue the **-fractureimage** command while the mirror is system fractured, the system will not try to communicate or resynchronize until you issue a **-syncimage** command.)

The software displays a message to confirm the fracture:

```
Do you want to fracture the image image UID (y/n)?
```

To fracture the mirror, answer `y`; to take no action, enter `n`.

SYNTAX

```
mirror -async -fractureimage -name name | -mirroruid uid
-imageuid uid
[-o]
```

OPTIONS

-name *name*

Specifies the name you gave to the mirror with the **-create** command.

-mirroruid *uid*

Specifies the unique 16-byte mirror ID (World Wide Name) that the software assigned when it created the mirror.

-imageuid *uid*

Specifies the unique 8-byte image ID of the secondary image to be fractured.

-o

Executes the command without prompting for confirmation.

EXAMPLE

For SP **ss1_spa** of the mirror named `db_mirror`, this command fractures the secondary image with the unique ID shown.

```
naviseccli -h ss1_spa mirror -async -fractureimage -name
db_mirror  -imageuid  50:06:06:10:00:FD:A1:6

Do you really want to fracture the image(y/n)? y
```

OUTPUT

If the version of FLARE software running on the SP does not support this command, a `Command is not supported` error message is printed to `stdout`. You may also receive other error messages.

mirror -async -info

Displays general information about asynchronous mirroring in a system.

PREREQUISITES

You must have a user account on the system on which you want to execute the command.

DESCRIPTION

This command, when used with **naviseccli** and no other switches, lists all general information for asynchronous mirror support. Issuing this command with one or more options displays the information based on the option issued. See the example for sample output.

SYNTAX

```
mirror -async -info [-cancreate]
[-maxmirrors]
[-maxremoteimages]
[-mirroredluns]
[-mirrorableluns]
[-systems [-connectiontype]]
[-all]
```

OPTIONS

-cancreate

Indicates whether an asynchronous mirror can be created in this system: yes or no.

-maxmirrors

Displays the maximum number of mirrors that can be created in this system.

-maxremoteimages

Specifies the maximum number of secondary images allowed. A maximum of one image is allowed.

-mirroredluns

Lists the LUN numbers of LUNs that are mirrored in this system. The list includes LUNs used as both secondary and primary images.

-mirrorableluns

Lists LUNs that can be mirrored in this system but are not mirrored at present.

-systems

Lists remote systems that can be used for a secondary image.

-connectiontype

Displays the connection type (fibre or iSCSI) for the enabled mirror. For unexpected error cases, it displays the value, unknown.

-all

Lists all properties of a session without having to type in any other switch.

EXAMPLE # 1

For SP **ss1_spa**, this command displays potential and current remote mirror information.

```
naviseccli -h ss1_spa mirror -async -info

Can a mirror be created on this system:YES

Maximum number of remote images: 1 Logical

Units that are mirrored in Primary Images:128 5

Logical Units that are mirrored in Secondary Images:0

Logical Units that can be mirrored:1 2 3 4 10 11 12 13
14 21 22 58 59

Remote systems that can be enabled for mirroring:

Array UID:  50:06:01:60:90:20:27:47

Status:  Enabled on both SPs Enabled Connection

Type(s): iSCSI  Disabled Connection Type(s): Fibre Maximum

Number of possible Mirrors: 100
```

EXAMPLE # 2

The following example shows the output for the **mirror -async -info** command for the VNX5300 Block and VNX5500 Block systems.

```
mirror –async –info –all
```

```
MirrorView port(s):
SP A:
I/O Module Slot:  Onboard
Physical Port ID:  3
Logical Port ID:  3
Port Type:  Fibre
I/O Module Slot:  1
Physical Port ID:  3
Logical Port ID: 5
Port Type:  iSCSI
SP B:
I/O Module Slot:  Onboard
Physical Port ID:  3
Logical Port ID:  3
Port Type:  Fibre
I/O Module Slot:  1
Physical Port ID:  3
Logical Port ID:  5
Port Type:  iSCSI
```

OUTPUT

If the version of the FLARE software running on the SP does not support this command, a `Command is not supported` error message is printed to `stdout`.

mirror -async -list

Displays information about existing asynchronous mirrors.

PREREQUISITES

You must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **naviseccli -async mirror** command with **-list** and no other switches lists all information for all mirrors on the system. Issuing this command with one or more options displays the information based on the option(s) issued. You can direct the command to any system; however, only the system holding the primary image of a mirror will always have the latest information about the mirror. Status obtained from other systems may be stale; do not use it unless the primary system is unavailable. See the example for sample output.

SYNTAX

```
mirror -async -list [-name [[name]] [-mirroruid] [uid]
[-description]
[-faulted]
[-images]
[-imagecount]
[-imagesize]
[-lun]
[-ownergroupuid]
[-ownergroupname]
[-requiredimages]
[-state]
[-timestamp]
[-transition]
```

OPTIONS

-name *name*

Specifies the name you gave the mirror with the **-create** function. You can use the mirror name or unique ID to obtain information on a mirror.

-mirroruid *uid*

Specifies the unique 16-byte remote mirror ID (World Wide Name) the software assigned when it created the mirror.

-description

Lists the meaningful title for the mirror, if any. The software does not use the description to identify the mirror.

-faulted

Lists whether the remote mirror is faulted: yes or no. If it is faulted, the mirror is either fractured or in the attention state.

-images

Displays image information, such as the role of the image (primary or secondary), image ID, WWN of the LUN containing the image, recovery policy, sync rate, image state, image condition, and image transitioning. It also displays the update type (Manual, Time elapsed since the start of last update, and Time elapsed since the end of the last update), the update period in minutes (displays N/A where not applicable), the time in minutes since the last update, the time in minutes until the next update, the last image error (why the image is faulted; displays the Not Available if no error).

-imagecount

Lists the current number of images that compose the mirror. This count includes the primary image.

-imagesize

Lists the size of the image (capacity of the LUN containing the image) in user blocks.

-lun

Lists the LUN number of the local image.

-ownergroupuid

Lists the unique ID value of the consistency group of which the mirror is a member.

-ownergroupname

Lists the unique name of the consistency group of which the mirror is a member.

-requiredimages

Lists the minimum number of secondary images required for the mirror.

-state

Describes the operational state of the mirror. Values are: active and attention.

-timestamp

Returns the clock time when the last update started.

-transition

Specifies whether the mirror is in a changing state.

EXAMPLE

```
naviseccli -h ss1_spa mirror -async -list

MirrorView Name:  pbc async ml 80
               MirrorView Description:
               MirrorView UID:
54:33:20:90:60:01:06:50:03:00:00:00:00:00:00:00
               Logical Unit Numbers:  80
               Remote Mirror Status:  Mirrored
               MirrorView State:  Active
               MirrorView Faulted:  NO
               MirrorView Transitioning:  NO
               Minimum number of images required:  0
               Image Size:  409600
               Image Count:  2
               Images:
               Image UID:  50:06:01:60:90:20:33:54
               Is Image Primary:  YES
               Logical Unit UID:
60:06:01:60:2F:E7:0C:00:3C:5B:04:A2:50:4C:D8:11
               Image Condition:  Unknown Image Condition

Image UID:  50:06:01:60:90:20:29:85
Is Image Primary:  NO
Logical Unit UID:  60:06:01:60:3F:E1:0D:00:A4:C9:01:63:B6:4C:D8:11
Image State:  Synchronized
Image Condition:  Normal
Recovery Policy:  Automatic
Synchronization Rate:  Medium
Image Faulted:  NO
Image Transitioning:  NO
Synchronizing Progress(%):  0
Update Type:  Manual
Time in secs since previous update:  12550
Time in secs until next update:  Not Available
```

OUTPUT

If the version of FLARE software running on the SP does not support this command, a `Command is not supported` error message is printed to `stdout`. You may also receive other error messages.

mirror -async -promoteimage

Promotes a secondary image to primary.

PREREQUISITES

You must have a user account on the system on which you want to execute the command.

DESCRIPTION

This command promotes a secondary image to the role of the primary image. The command is successful if it can promote the secondary to a primary that is server-accessible. You must direct this command to a system that holds the secondary image — never to the system that holds the primary. The command will fail if you issue it to the system that holds the primary image.

You can promote a secondary image if the secondary is in a synchronized or consistent state. There must be no current update, in addition to the state restrictions listed.

When you promote a secondary image to primary, the software assigns a new mirror UID to the promoted image to distinguish it from the old mirror. The new status of the old primary image depends on whether the old primary image is accessible when promotion occurs.

After promoting an image, you must explicitly add the newly promoted image to an appropriate storage group. EMC recommends that you also remove the old primary from its storage group, if possible.

In normal operation when there is no failure, you can (but probably would not want to) promote a secondary image. If you do so, the primary image is demoted to secondary. The new primary image inherits the mirror properties of the demoted primary image. Before issuing this command consider the following:

- If possible, the secondary image should be synchronized (synchronized state) with the primary image. If the secondary image is in the consistent state (not synchronized state) when you promote it to primary image, data will probably be lost during the promotion process.

  The secondary image to be promoted must be in a consistent or synchronized state. If the secondary image is out-of-sync or synchronizing, then you cannot promote it; an error will result.

- You must stop I/O to an accessible primary image before you issue this command. If I/O continues to the original primary, data may be lost as the software demotes the primary to secondary and/or an SP may reboot unexpectedly during the attempted promotion.

SYNTAX

```
mirror -async -promoteimage -name name | -mirroruid uid
```

```
-imageuid imageuid
[-type normal|oos|local ] [-o]
[-type type]
[-o]
```

OPTIONS

-name *name*

Specifies the name you gave the mirror with the **-create** command. You can use the mirror name or unique ID to promote a secondary image.

-mirroruid *uid*

Specifies the unique 16-byte mirror ID (World Wide Name) that was assigned when the mirror was created. For any letters in the ID, see comments under **-imageuid** below.

-imageuid *uid*

Specifies the unique 8-byte image ID of the secondary image you want to promote. For any letters in the ID, you must specify the same case as the software assigned to the image when it created the mirror (use the **mirror -list** function).

-type normal|oos|local

Checks the status of the mirror images. Normal (the default) directs the driver to perform internal safety checks and return the appropriate error if the promotion would cause an out-of-sync state for the old primary or remote image if the mirror is unreachable. OOS indicates that no safety check is performed, and the promote will occur even if it results in an out-of-sync state for the old primary. Local results in promoting the local image only to the primary. The driver attempts to contact the old primary, and if it reaches it, the old primary removes its secondary image.

-o

Runs the command without prompting for confirmation.

EXAMPLE

For SP **ss1_spa**, the owner of the remote mirror named **db_mirror**, this command promotes the secondary image with the unique ID shown.

```
naviseccli -h ss1_spa mirror -async -promoteimage
-name db_mirror -imageuid 50:06:06:10:00:FD:A1:6
```

OUTPUT

If the version of FLARE software running on the SP does not support this command, a `Command is not supported` error message is printed to `stdout`. You may also receive other error messages.

mirror -async -removeimage

Removes a secondary image from a mirror.

PREREQUISITES

You must have a user account on the system on which you want to execute the command.

DESCRIPTION

This command is used with **naviseccli** to remove a secondary image from the remote mirror. You must issue this command to a system that holds the primary image.

Note: If an update is in progress, this command will not execute. We recommend that you fracture the secondary image first, and then you can issue the **mirror -async -removeimage** command.

If you omit the **-override** option, the software displays a message to confirm the remove operation:

```
Removing of the image will stop mirroring of data to the specified
image. It may cause the minimum number of images required parameter
to be violated that will cause the mirror to go into attention state.
Do you really want to remove the image(y/n)?
```

Answering yes will remove the image.

SYNTAX

mirror -async -removeimage -name *name* | **-mirroruid** *mirroruid*
-arrayhost *sp-hostname* | *sp-IP-address* | **-imageuid** *imageuid* [**-o**]

OPTIONS

-name *name*

Specifies the name you gave the mirror with the **-create** command. You can use the mirror name or unique ID to remove a secondary image.

-mirroruid *uid*

Specifies the unique 16-byte remote mirror ID (World Wide Name) assigned when the software created the mirror. For any letters in the ID, see comments under **-imageuid** below.

-arrayhost *sp-hostname* | *sp-IP-address*

Specifies the hostname or network address of the remote SP that holds the secondary image you want to remove. If you specify this switch, the driver(s) from the secondary LUN stack is removed.

-imageuid *image-uid*

Specifies the unique 8-byte image ID of the secondary image you want to remove. For any letters in the ID, you must specify the same case as the software assigned to the image when it created the mirror (use the **mirror -list** command). If you specify this switch, you must explicitly remove the driver(s) from the secondary LUN stack using the **-setfeature** command.

-o

Executes the command without prompting for confirmation.

EXAMPLE

For SP address **ss1_spa**, the owner of the mirror named `db_mirror`, this command removes the image with the unique ID shown.

```
naviseccli -h ss1_spa mirror -async -removeimage
-name db_mirror -imageuid 50:06:06:10:00:FD:A1:6
```

OUTPUT

If the version of FLARE software running on the SP does not support this command, a `Command is not supported` error message is printed to `stdout`. You may also receive other error messages.

mirror -async -setfeature

Adds or removes an asynchronous mirror driver to or from the LUN stack.

PREREQUISITES

You must have a user account on the system on which you want to execute the command.

DESCRIPTION

Use this command with **naviseccli** (see naviseccli) to add the asynchronous mirror driver to or remove it from the LUN stack depending on whether you specify the **-on** or **-off** option. You must issue this command to the system where the LUN resides.

Note: **-setfeature** is needed only if you want to use the **-arrayuid** switch to specify the remote system for the **-addimage** command.

SYNTAX

mirror -async -setfeature -on | **-off -lun** *lun_number* | **-lunuid** *uid*

OPTIONS

-on

Adds the driver to the LUN stack.

-off

Removes the driver from the LUN stack.

-lun *lun_number*

Specifies the LUN number to which you want to add or from which you need to remove the driver.

-lunuid *uid*

Specifies the unique 16-byte identification number (World Wide Name) of the LUN to which you will add the driver or from which you will remove the driver.

EXAMPLE

For SP **ss1_spa**, this command starts adding the driver to LUN 112.

```
naviseccli -h ss1_spa mirror -async -setfeature -on
-lun 112
```

OUTPUT

If the version of FLARE software running on the SP does not support this command, a `Command is not supported` error message is printed to `stdout`. You may also receive other error messages.

mirror -async -syncimage

Starts an update of the secondary image.

PREREQUISITES

You must have a user account on the system on which you want to execute the command.

DESCRIPTION

Use this command with **naviseccli** (see naviseccli on page 35) to begin the synchronization operation on a secondary image that was previously administratively fractured or on one where the mirror image condition is normal. You must issue this command to the system that holds the primary image. The secondary image should be fractured when performing this operation. If you specify a secondary image that is not fractured, an internal error message will be returned.

The software displays a confirmation message:

```
During synchronization, array performance will be impacted. Do you
want to sync the image (y/n)?
```

Answering `y` will start synchronization.

SYNTAX

mirror -async -syncimage -name *name* | **-mirroruid** *mirroruid* **-imageuid** *imageuid* [**-o**]

OPTIONS

-name *name*

Specifies the name given to the mirror with the **-create** command. You can use the mirror name or unique ID to update a secondary image.

-mirroruid *uid*

Specifies the unique 16-byte remote mirror ID (World Wide Name) assigned when the software created the mirror. For any letters in the ID, see comments under **-imageuid** below.

-imageuid *imageuid*

Specifies the unique 8-byte image ID of the secondary image you will synchronize. For any letters in the ID, you must specify the same case as the software assigned to the image when the software created the mirror (use the **mirror -list** command).

-o

Executes the command without prompting for confirmation.

EXAMPLE

For SP **ss1_spa**, the owner of the mirror named **db_mirror**, this command starts synchronizing the image with the unique ID shown.

```
naviseccli -h ss1_spa mirror -async -syncimage
-name db_mirror -imageuid 50:06:06:10:00:FD:A1:6

During synchronization, array performance will be impacted. Do you
want to sync the image (y/n)? y
```

OUTPUT

If the version of FLARE software running on the SP does not support this command, a `Command is not supported` error message is printed to `stdout`. You may also receive other error messages.

MirrorView/A consistency group commands

This section explains the commands for creating and managing groups of mirrors on CX4 series, CX3 series, CX series, and AX4-5 series systems with the EMC MirrorView/A option. This section refers to groups of mirrors as *consistency groups*.

Note: The LUNs in a MirrorView/A consistency group must reside on the same system, unlike the volumes in a Symmetrix consistency group, which can reside on multiple systems.

mirror -async -creategroup

Establishes a consistency group to which you can later add mirrors.

PREREQUISITES

You must have a user account on the system on which you want the command executed.

DESCRIPTION

This command is used with **naviseccli** to create a consistency group to which you can add mirrors with subsequent commands. You must direct the command to the system on which you are creating the MirrorView/A group.

Note: On AX4-5, CX500, CX3 model 10, and CX3 model 20 systems, you can have 8 consistency groups, and each consistency group can have up to 8 mirrors. On CX700, CX3 model 40, and CX3 model 80 systems, you can have 16 consistency groups, and each consistency group can have up to 16 mirrors. On CX4 systems, you can have 64 consistency groups. On CX4-120 and CX4-240 systems, each consistency group can have up to 32 mirrors. On CX4-480 and CX4-960 systems, each consistency group can have up to 64 mirrors.

SYNTAX

```
mirror -async -creategroup -name name | -mirroruid uid
[-description description]
[-manualupdate | -delaystart minutes | -enddelay minutes]
[-syncrate rate] [-o]
[-recoverypolicy policy][-o]
```

OPTIONS

-name *name*

Specifies the name of the consistency group. Use only alphanumeric characters for the consistency group name. The name can be up to 35 characters.

-description *description*

Specifies a textual description of the consistency group.

-manualupdate

Specifies that you must explicitly start each update of the group. If you specify neither **-manualupdate**, **-delaystart**, nor **-enddelay**, the default is **-enddelay** 60.

Note: When a consistency group begins an update, the mirrors within the group begin updating and end whenever each individual update finishes. The consistency group update completes when the last mirror completes. If an update is not running, you can manually start an update even if an automatic update interval is set.

-delaystart *minutes*

Specifies the time (in minutes) from the start of the previous update until the start of the next one. If the previous update has not completed, the next update is delayed until the update in progress has completed. If you specify neither **-manualupdate**, **-delaystart**, nor **-enddelay**, the default is **-enddelay** 60.

-enddelay *minutes*

Specifies the time (in minutes) from the end of the previous update until the start of the next one. Specifying a value of 0 results in the group being updated as fast as possible. If you specify neither **-manualupdate**, **-delaystart**, nor **-enddelay**, the default is **-enddelay** 60.

-syncrate *rate*

Specifies a relative value (low, medium, or high) for the priority of completing updates. Values for rate are low, medium, or high. High completes updates faster, but may significantly affect system performance for server I/O requests. Low completes updates slower, but also minimizes the impact on other system operations.

-recoverypolicy *policy*

Specifies the policy for recovering the mirrors in a group after a failure causes a system fracture. Values are:

manual: Update of the secondary image does not begin until you explicitly issue a **synchronize** command.

auto: Update of the secondary image automatically begins as soon as the connection between the two systems is again operational.

-o

Executes the command without prompting for confirmation.

Note: All the switches, except **-name** and **-o**, are meaningful only if the system receiving the command hosts the primary images for the mirrors in the consistency group.

EXAMPLE

For SP `ss1_spa`, this command creates a consistency group with the name **dbgroup**.

```
naviseccli -h ss1_spa mirror -async -creategroup -name dbgroup
```

OUTPUT

If the version of FLARE software running on the SP does not support this command, a `Command is not supported` error message is printed to `stdout`. You may also receive other error messages.

mirror -async -destroygroup

Destroys a consistency group.

PREREQUISITES

You must have a user account on the system on which you want to execute the command.

DESCRIPTION

This command is used with **naviseccli** (see naviseccli) to destroy a consistency group. It is the counterpart of **-creategroup**.

Note: Make sure that the consistency group is empty before destroying it.

If you omit the override option, the system displays a message to confirm the destruction of the consistency group:

```
Do you really want to destroy the group <group-name>? (y/n)?
```

To destroy the consistency group, answer `y`; to take no action, enter `n`.

SYNTAX

```
mirror -async -destroygroup -name  name | -groupid id
[-force] [-o]
```

OPTIONS

-name *name*

Specifies the name you gave the mirror with the **-creategroup** command. You can also use the consistency group ID.

-groupid *id*

Specifies the consistency group unique ID assigned when the consistency group was created.

-force

Destroys the consistency group even if it is not empty.

Note: Particularly in a failure situation you can use the **-force** switch to destroy a group that still has members.

-o

Executes the command without prompting for confirmation.

EXAMPLE

For SP `ss1_spa`, this command destroys the consistency group that was created with the name **dbgroup**.

```
naviseccli -h ss1_spa mirror -async -destroygroup dbgroup

Do you really want to destroy the group dbgroup?(y/n)? y
```

OUTPUT

If the version of FLARE software running on the SP does not support this command, a `Command is not supported` error message is printed to `stdout`. You may also receive other error messages if the command fails.

mirror -async -addtogroup

Adds a mirror to a previously created consistency group.

PREREQUISITES

You must have a user account on the system on which you want to execute the command.

DESCRIPTION

This command is used with **naviseccli** (see naviseccli) to add one mirror at a time to a consistency group.

Note: The mirror you specify must have its primary image on the system. No two secondary images of mirrors in the consistency group can be on different systems.

SYNTAX

```
mirror -async -addtogroup -name  name | -groupid id
-mirrorname name | -mirroruid id
```

OPTIONS

-name *name*

Specifies the name of the consistency group to which you want to add the mirror.

-groupid *id*

Specifies the unique ID of the consistency group to which you want to add the mirror.

-mirrorname *name*

Specifies the name of the mirror you want to add to the consistency group.

-mirroruid *id*

Specifies the World Wide Name of the mirror you want to add to the consistency group.

EXAMPLE

For SP `ss1_spa`, this command adds the mirror, **Sales Accounts Mirror to Europe**, to the consistency group, **dbgroup**.

```
naviseccli -h ss1_spa mirror -async -addtogroup
-name dbgroup -mirrorname "Sales Accounts Mirror to Europe"
```

OUTPUT

If the version of FLARE software running on the SP does not support this command, a `Command is not supported` error message is printed to `stdout`. You may also receive other error messages.

mirror -async -removefromgroup

Removes a mirror from a consistency group.

PREREQUISITES

You must have a user account on the system on which you want to execute the command.

DESCRIPTION

This command is used with **naviseccli** (see naviseccli) to remove one mirror at a time from the consistency group.

Note: The mirror you specify must have its primary image on the system. This does not apply if you use the **-force** switch.

If you omit the **-o** option, the software displays a message to confirm the remove operation. Answering yes will remove the mirror.

SYNTAX

```
mirror -async -removefromgroup -name name | -groupid id
-mirrorname name | -mirroruid id[-force] [-o]
```

OPTIONS

-name *name*

Specifies the name of the consistency group from which you want to remove the mirror.

-groupid *id*

Specifies the unique ID of the consistency group to which you want to add the mirror.

-mirrorname *name*

Specifies the name of the mirror you want to remove from the consistency group.

-mirroruid *id*

Specifies the World Wide Name of the mirror you want to remove from the consistency group.

-force

Removes the mirror even if the connection with the remote system is not functioning.

-o

Executes the command without prompting for confirmation.

EXAMPLE

For SP **ss1_spa**, the owner of the consistency group named **dbgroup**, this command removes the mirror with the unique ID shown.

```
naviseccli -h ss1_spa mirror -async -removefromgroup
-name dbgroup -mirroruid

83:5A:20:90:60:01:06:50:01:00:00:00:00:00:00:00
```

OUTPUT

If the version of FLARE software running on the SP does not support this command, a `Command is not supported` error message is printed to `stdout`. You may also receive other error messages.

mirror -async -changegroup

Changes consistency group properties.

PREREQUISITES

You must have a user account on the system on which you want to execute the command.

DESCRIPTION

This command is used with **naviseccli** to change one or more parameters of a consistency group.

You must specify at least one of the optional switches. If you omit the override option, then it displays a message similar to the following for each parameter to confirm the change.

```
Do you want to change the group synchronization rate from Medium to
High (y/n)?
```

To change a parameter, enter `y`.

SYNTAX

```
mirror -async -changegroup -name name | -groupid id
[-description description]
[-manualupdate | -delaystart minutes | -enddelay minutes]
[-syncrate rate]
[-recoverypolicy policy] [-o]
```

OPTIONS

-name *name*

Specifies the name of the consistency group you want to change. You can specify either the consistency group name or ID (next).

-groupid *id*

Specifies the unique ID of the consistency group you want to change.

-description *description*

Specifies a textual description for the consistency group.

-manualupdate

Specifies that you must explicitly start each update of the group.

-delaystart *minutes*

Specifies the time (in minutes) from the start of the previous update until the start of the next one. If the previous update has not completed, the next update is delayed until the update in progress has completed.

-enddelay *minutes*

Specifies the time (in minutes) from the end of the previous update until the start of the next one. Specifying a value of 0 results in the group being updated as fast as possible.

-syncrate *rate*

Specifies a relative value (low, medium, or high) for the priority of completing updates. Values for rate are low, medium, or high. High completes updates faster, but may significantly affect system performance for server I/O requests. Low completes updates slower, but also minimizes the impact on other system operations.

-recoverypolicy *policy*

Specifies the policy for recovering the mirrors in a group after a failure causes a system fracture. Values are:

manual: Update of the secondary image does not begin until you explicitly issue a **synchronize** command.

auto: Update of the secondary image automatically begins as soon as the connection between the two systems is again operational.

-o

Executes the command without prompting for confirmation.

EXAMPLE

For system `server1`, consistency group `dbgroup`, this command changes the synchronization rate to `high`.

```
naviseccli -h server1 mirror -async -changegroup -name
dbgroup -syncrate high
```

OUTPUT

If the version of FLARE software running on the SP does not support this command, a `Command is not supported` error message is printed to `stdout`. You may also receive other error messages.

Use the **-listgroups** command on the mirror to confirm that the changes were made.

mirror -async -syncgroup

Starts an update of the consistency group.

PREREQUISITES

You must have a user account on the system on which you want to execute the command.

DESCRIPTION

This command is used with **naviseccli** to begin the synchronization operation on a consistency group. All the images in the consistency group must be primary.

SYNTAX

```
mirror -async -syncgroup -name name | -groupid id
[-synctype startnow]
[-o]
```

OPTIONS

-name *name*

Specifies the name of the consistency group you want to update or synchronize. You can specify either the consistency group name or id (next).

-groupid *id*

Specifies the unique ID of the consistency group you want to update or synchronize.

-synctype startnow

Starts synchronization immediately. startnow is the only currently supported option.

-o

Executes the command without prompting for confirmation.

EXAMPLE

For SP `ss1_spa`, the owner of the consistency group named `dbgroup`, this command starts synchronizing the consistency group immediately.

```
naviseccli -h ss1_spa mirror -async -syncgroup -name dbgroup
 -synctype startnow
```

OUTPUT

If the version of FLARE software running on the SP does not support this command, a `Command is not supported` error message is printed to `stdout`. You may also receive other error messages.

mirror -async -fracturegroup

Fractures all image(s) in a consistency group.

PREREQUISITES

You must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **naviseccli mirror -async** command with **-fracturegroup** starts an administrative fracture of all images in the consistency group, even if they are already system fractured. The consistency group cannot be in a scrambled state, and all images must be primary. If the consistency group is in the process of updating, it stops.

SYNTAX

```
mirror -async -fracturegroup -name name | -groupid id
[-fracturetype abort]
[-o]
```

OPTIONS

-name *name*

Specifies the name of the consistency group you want to fracture. You can specify either the consistency group name or ID (next).

-groupid *id*

Specifies the unique ID of the consistency group you want to fracture.

-fracturetype abort

Specifies that you want to abort an update if one is in progress. The secondary retains any extents that have been copied to the secondary, and therefore do not need to be resent on the next synchronization.

-o

Executes the command without prompting for confirmation.

EXAMPLE

For SP **ss1_spa**, with the consistency group named **dbgroup**, this command fractures all the images in the consistency group.

```
naviseccli -h ss1_spa mirror -async -fracturegroup
-name dbgroup
```

OUTPUT

If the version of FLARE software running on the SP does not support this command, a `Command is not supported` error message is printed to `stdout`. You may also receive other error messages.

mirror -async -promotegroup

Promotes all secondary images in a consistency group to primary images.

PREREQUISITES

You must have a user account on the system on which you want to execute the command.

DESCRIPTION

This command promotes all secondary images to the role of the primary images. This command is used with **naviseccli** (see naviseccli).

SYNTAX

```
mirror -async -promotegroup -name name | -groupid id
[-type type] [-o]
```

OPTIONS

-name *name*

Specifies the name of the consistency group you want to promote. You can specify either the consistency group name or ID (next).

-groupid *id*

Specifies the unique ID of the consistency group you want to promote.

-type *type*

Specifies the type of promotion. Values are:

normal (default), which causes a failure if the connection to the primary system is not functioning or if at least one set of the images to promote are not synchronized with the primaries. Otherwise, it will destroy the original mirrors and create new ones with the targeted secondaries as primaries and the original primaries as secondaries.

local, which does not attempt to add back the original primaries as secondaries, but always creates new mirrors with only primary images consisting of the targeted secondaries.

oos (out-of-sync), which attempts a normal promotion, reversing the original roles of primaries and secondaries even if they are not all synchronized. If the connection to the primary system is not functioning, a local promotion will occur.

-o

Runs the command without prompting for confirmation.

EXAMPLE

For SP **ss1_spa**, the owner of the consistency group named **dbgroup**, this command promotes all secondary images:

```
naviseccli -h ss1_spa mirror -async -promotegroup -name
dbgroup
```

OUTPUT

If the version of FLARE software running on the SP does not support this command, a `Command is not supported` error message is printed to `stdout`. You may also receive other error messages.

mirror -async -listgroups

Displays information about existing consistency groups.

PREREQUISITES

You must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **naviseccli mirror -async** command with **-listgroups** and no other switches lists all information for all asynchronous consistency groups on the system. Issuing this command with one or more options displays the information based on the option(s) issued. This command is used with **naviseccli** (see naviseccli).

SYNTAX

```
mirror -async -listgroups [-name[name]] [-groupid[-id]]
[-feature] [-update] [-nextupdate]
[-syncrate] [-state] [-role] [-mirrors]
[-condition][-recoverypolicy] [-description]
```

OPTIONS

-name *name*

Specifies the name of the consistency group whose information you want to display. If you do not specify the name of the consistency group with this switch, that piece of information will be provided for the consistency group(s) being displayed.

-groupid *id*

Specifies the unique ID of the consistency group whose information you want to display.

-feature

Displays the maximum number of consistency groups allowed on the system and the maximum number of members per consistency group.

-update

Displays the type of update as either manual, Time elapsed since the start of the last update (in minutes), or Time elapsed since the end of the last update (in minutes). On the next line it also displays the Update Period in minutes. If the Update Period is not applicable, it displays N/A.

-nextupdate

Displays the number of minutes until the next update.

-syncrate

Displays the rate at which data is transferred during updates and initial synchronizations.

-state

Displays Synchronized, Out-of-Sync, Synchronizing, Consistent, Rollingback, Quasi-Consistent, Scrambled, Incomplete, Local Only, or Empty.

-role

Displays Primary, Secondary, or Unknown.

-mirrors

Displays the mirror name, mirror uid, the IDs of both images in the pair, and the system ID of the paired image.

-condition

Displays the consistency group condition as Normal, Initializing, Updating, Admin Fractured, System Fractured, Waiting on Admin.

-recoverypolicy

Displays either manual or automatic to describe whether the system will wait for you to restart updates in the event of a system fracture, after the problem is corrected.

-description

Displays the description associated with the consistency group.

EXAMPLE

```
naviseccli -h 10.14.5.200 mirror -async -listgroups

Group Name:  taraFARGroup

Group ID:  50:06:01:60:90:20:5A:83:00:00:00:00

Description:

Maximum Number of Groups Allowed:  16

Maximum Number of Mirrors per Group:  16

Update Type:  Manual

Time to next update:  0

State:  Quasi Consistent
```

```
Role:  Secondary

Mirror Name:  taraFAR202

Mirror WWN:  C6:05:20:88:60:01:06:50:08:00:00:00:00:00:00:00

Primary WWN:  50:06:01:60:88:20:05:C6

Secondary WWN:  50:06:01:60:90:20:5A:83

Array hosting remote image:  50:06:01:60:88:20:05:C6

Mirror Name:  taraFAR201

Mirror WWN:  C6:05:20:88:60:01:06:50:07:00:00:00:00:00:00:00

Primary WWN:  50:06:01:60:88:20:05:C6

Secondary WWN:  50:06:01:60:90:20:5A:83

Array hosting remote image:  50:06:01:60:88:20:05:C6

Mirror Name:  taraFAR200

Mirror WWN:  C6:05:20:88:60:01:06:50:06:00:00:00:00:00:00:00

Primary WWN:  50:06:01:60:88:20:05:C6

Secondary WWN:  50:06:01:60:90:20:5A:83

Array hosting remote image:  50:06:01:60:88:20:05:C6

Condition:  Admin Fractured - Intervention required

Sync Rate:  Medium

Recovery Policy:  Manual

Group Name:  HWLocalPromoteTestGroup

Group ID:  50:06:01:60:90:20:5A:83:01:00:00:00

Description:

Maximum Number of Groups Allowed:  16

Maximum Number of Mirrors per Group:  16

Update Type:  Manual

Time to next update:  0

State:  Synchronized

Role:  Secondary

Mirror Name:  HWLocalPromoteTestMirror
```

```
Mirror WWN:  C6:05:20:88:60:01:06:50:09:00:00:00:00:00:00:00

Primary WWN:  50:06:01:60:88:20:05:C6

Secondary WWN:  50:06:01:60:90:20:5A:83

Array hosting remote image:  50:06:01:60:88:20:05:C6

Condition:  Normal

Sync Rate:  Medium

Recovery Policy:  Manual
```

OUTPUT

If the version of FLARE software running on the SP does not support this command, a `Command is not supported` error message is printed to `stdout`. You may also receive other error messages.

Responding to failures

This section describes how MirrorView/A and consistency groups handle failures.

How MirrorView/A handles failures

When a failure occurs during normal operations, MirrorView/A lets you perform several actions to recover.

In recovering from failures, MirrorView/A achieves two goals:

- Preserves data integrity
- Minimizes the amount of time that data is unavailable to the user

Access to the primary SP fails

If an SP that owns mirrored LUNs on the primary system fails, MirrorView/A on the other SP takes ownership of those mirrored LUNs by trespassing them when something on the server (like PowerPath) initiates the trespass. This allows mirroring to continue, provided the server is set up properly to handle the failover (for example, a Windows server with PowerPath). When the primary LUN is trespassed, MirrorView/A sends a trespass request to any secondary images when the next update starts. Therefore, you may notice that the mirrored LUNs on the secondary system have moved from SP A to SP B, or vice versa. MirrorView/A keeps the SP ownership the same on the primary and secondary systems during updates. If the primary image is on SP A, then the secondary image will be on SP A. This may not occur until the start of the next update.

Primary image fails

If the system controlling the primary image fails, access to the mirror stops until you either repair the system or promote a secondary image of the mirror to primary.

Promoting a secondary image to primary

In situations where you must replace the primary system due to a catastrophic failure, you can use a promotion to access data on the secondary system. To recover and restore I/O access, you must promote a secondary mirror image to the role of primary mirror image, so that a server can access it.

Note: You can also promote a secondary image even if there has not been a catastrophic failure.

If the primary image and secondary image can communicate with each other, then when the secondary image is promoted, the former primary image is demoted to a secondary image.

To promote a secondary image, the following conditions must be true:

- You must direct the **naviseccli mirror** commands to the system holding the secondary image.
- The state of the secondary image you will promote must be either Consistent or Synchronized.
- An update is not currently transferring data for this mirror.

CAUTION

Promoting a secondary image will cause loss of data written to the primary image after the start of the last completed update. If any updates have been made to the primary image since that time, a full resynchronization of the mirror will be required after the promotion. Also, if an update is currently active (that is, transferring data), the promotion will not be allowed; allow the update to complete and the image to transition into the Synchronized state; then perform the promotion. An alternative to allowing the update to complete is to fracture the image.

In a failure situation, before promoting a secondary image to a primary image:

- If the existing primary image is accessible, remove the primary image from any storage groups before promoting the secondary image to avoid I/O and therefore inconsistent data.
- Ensure that no I/O, either generated from a server or by an update in progress, is occurring in the asynchronous mirror.
- If the existing primary is available, make sure that it lists the secondary image that is to be promoted as "synchronized."

To promote a secondary image to a primary image:

1. Issue the **mirror -async -promoteimage** command. See mirror -async -promoteimage on page 758

   Note: If the original primary system failed, remove the primary system from the domain.

   If you do not specify the **-type** switch, the command performs a normal promote.

2. Add the newly promoted image to a storage group if necessary.

At some point later, you can also perform the following steps:

1. Verify that the failed system is not the master of the domain.

   If it is, assign another system to be the master. See the *EMC Navisphere Command Line Interface (CLI) Reference.*

2. Verify that the failed system is not a portal.

If it is a portal, remove the portal and configure a different system as a portal. See the *EMC Navisphere Command Line Interface (CLI) Reference*.

Example promote mirror scenario #1

You attempt to promote a mirror that has a secondary image, but the connection between the systems is not working. The secondary image indicates that it is synchronized, when it is actually system fractured and consistent. An error, Existing image unreachable, appears. You can investigate the reason for the loss of connectivity and correct the problem before continuing with the promotion, or you can select the Local Only Promote option to complete the promotion.

If you select Local Only Promote, the software promotes the local mirror and attempts to contact the original primary image and remove the promoted image from the mirror. In the case described here, it cannot contact the other system, so it converts the local image to a primary image in a mirror with no secondary images.

Note: In this scenario, a Force Promote has exactly the same effect as the Local Only Promote operation.

Since the software cannot contact the remote system, the original mirror still exists on the system originally hosting the primary image. However, even if connectivity is restored, any attempt to start an update will fail (since the secondary has been promoted), and the secondary image will remain administratively fractured forever. You should use **Force Destroy** to remove this original mirror.

Example promote mirror scenario #2

You attempt to promote a mirror whose secondary image is in the Consistent state. An error, Existing primary will be out-of-sync, appears. If possible, allow the secondary to go to the Synchronized state (for example, stop application I/O to the primary image, flush data from the server, start an update and wait for it to complete). You can then promote the secondary without requiring a full resynchronization. Otherwise, you can select either the Force Promote or the Local Only Promote option to continue the promotion. In either case, you must perform a full resynchronization before you have the mirror providing protection for your data again.

Failure of the secondary image

When a primary image cannot communicate with a secondary image, it marks the secondary as unreachable and will system or administratively fracture the secondary image. Verify the Last Image Error field for details about the cause of the failure and take the appropriate action to fix it. The secondary image is marked System Fractured. The loss of communication may be due to a link between systems, an SP failure on the secondary system, or some other failure on the secondary system. In the event of the communication failure, the secondary image remains a member of the mirror.

If the mirror is set for automatic recovery, an update automaticallly starts once the secondary system is again accessible. Otherwise, you must manually start the update.

Promoting a secondary image when there is no failure

You may want to promote your secondary image even if no failure occurs on the systems. For example, you may want to test your disaster recovery procedure before a real failure occurs, or perhaps the server attached to the primary system failed, and you must resume operations using the server attached to the secondary system.

If the original primary is accessible when you promote the secondary, the software verifies whether the images are identical. If possible, the secondary image should be in the Synchronized state (stop application I/O, flush data from the servers, start and update and wait for it to complete). If the images are identical, they swap roles, resynchronization is not necessary, and the promotion is complete. If the images are potentially different (that is, the secondary image is not in the Synchronized state), then you must specify the type of promotion. As part of a promotion, any secondary images in the new mirror are set to manual recovery.

Mirror before promotion	Mirror after promotion
mirror ID = aaa primary image = LUN xxxx secondary image = LUN yyyy	mirror ID = bbb primary image = LUN yyyy secondary image = LUN xxxx

If the images are not synchronized, you can choose to forcibly promote (oos), locally promote, or to not promote. OOS promote and local promote require a full resynchronization of the data before mirrored protection is again in effect.

Summary of MirrorView/A failures

Table 16 on page 791 shows how MirrorView/A might help you recover from system failure at the primary and secondary sites. It assumes that the secondary image of the mirror is in either the Synchronized or Consistent state.

Table 16. Summary of MirrorView/A failures

Event	Result and recovery
Loss of access to primary image LUN	Check connections between the server and system, including zoning and correct operation of any switches. Check for an SP reboot.
Secondary SP is rebooted	If the secondary SP reboots, for example, due to a software failure, an explicit command or the SP is physically pulled and reseated, you may see the secondary image become system fractured. It is also possible for the secondary to become administratively fractured, in which case simply synchronize the image.

Table 16. Summary of MirrorView/A failures *(continued)*

Event	Result and recovery
Server accessing primary image fails	Catastrophic failure. I/O stops. After two more update periods, if the secondary image is in the Consistent state, it will transition to the Synchronized state. Nothing more happens until the server is repaired or replaced, or a secondary image is promoted.
System running primary image fails	Option 1 - Catastrophic failure. The mirror is left in the state it was already in. If the secondary image is in either the Consistent or Synchronized state, it may be promoted to provide access to your data. Note: Any writes to the primary since the start of the last completed update are not propagated to the secondary.
	Option 2 - Noncatastrophic failure, repair is feasible. The administrator has the problem fixed, and then normal production operation can resume.
	Option 3 - Only one SP fails. If the SP that controls the mirror fails, software on the server (for example, PowerPath) can detect the failure. This software can then cause control of the mirror to be transferred to the surviving SP, and normal operations can continue. If such software is not running on the server, then you must either manually transfer control using Navisphere, or access to the mirror stops until the SP is back in service. If the SP that does not control the LUN fails, then mirroring continues as normal.

Table 16. Summary of MirrorView/A failures *(continued)*

Event	Result and recovery
System running secondary image fails	◆ If the SP that does not control the secondary image fails, nothing happens with respect to this mirror. ◆ If the SP that controls the mirror fails (or both SPs fail or a catastrophic failure of the entire system occurs), the secondary image of the mirror will become system fractured at the start of the next update. If the mirror is appropriately configured, this will cause the mirror to go into the Attention state, although I/O will continue as normal to the primary image. The administrator has a choice: If the secondary can easily be fixed (for example, if someone pulled out a cable), then the administrator can have it fixed and let things resume. Otherwise, to regain protection of your data and ensure that you have another system available, you can force destroy the existing mirror, recreate it, and add a secondary image on another working system. Protection is not established until the full synchronization of the secondary image completes.
Loss of connection between systems (indicated by system fractures)	◆ Verify zoning of ports and switches for the MirrorView connection between systems. ◆ Verify all cables are properly seated and in the correct location. ◆ Check the switch logs to ensure no connection or firmware issues. ◆ Verify port speeds and switch port speeds for the MirrorView ports. ◆ Determine if the connectivity loss is on one or both SPs. ◆ Verify that the system or SP is operating properly with no other faults or symptoms. ◆ Try to disable and re-enable the MirrorView connection from both systems.

Table 16. Summary of MirrorView/A failures *(continued)*

Event	Result and recovery
Failures when adding secondary images	Make sure that: ◆ The connection between systems works. ◆ You are managing both systems (which may require managing two domains). ◆ The secondary LUN is available and the same size as the primary image. ◆ The secondary image LUN is not in the storage group. ◆ The secondary image LUN is not already a secondary image, of either a synchronous or asynchronous mirror. ◆ The reserved LUN pools on both primary and secondary systems are adequately configured. ◆ The secondary LUN is not set up as a destination for SAN Copy.
When the secondary image cannot be synchronized	Make sure that: ◆ The connection between the systems is still good. ◆ The recovery policy is set to auto, not manual. ◆ The secondary SP is working. ◆ If the image is fractured, view the Last Image Error. Try manually fracturing and then manually synchronizing the image.

Recovering from serious errors

In the unlikely event that the mechanism for tracking changes made to the primary image fails (for example, insufficient memory is available on the SP), the secondary image is marked as permanently fractured. To recover from this situation, you must remove the secondary image from the mirror, and then add it again (which does a full resynchronization). This failure may indicate that you are using close to the system's capacity for layered features.

Some other serious failures will transition MirrorView/A into a degraded mode of operation, where administrative requests will be rejected and no further updates run. Degraded mode affects only a single SP; the other SP in the system may continue to run normally (depending on the nature of the failure).

When an SP enters degraded mode, the system logs an event that indicates why MirrorView/A is in the degraded mode. Usually you can recover from the degraded mode by simply rebooting the affected SP, but some specific cases require you to check other components that MirrorView/A uses before rebooting the SP. Table 17 on page 795 lists various scenarios in which MirrorView/A goes to the degraded mode and the recovery options you can take.

Table 17. Recovery from degraded mode

Event	Result and recovery
Internal memory corruption	Mirror data does not match the expected value. Reboot the SP.
Serious, unexpected errors	MirrorView/A receives unexpected errors from its underlying components during operation. Look at the event log for a record of errors, and take steps to correct them. For example, if the reserved LUN pool LUNs are faulted, recover the reserved LUN pool LUNs. Then reboot the SP.
Internal fracture failure	A fracture operation fails due to reasons other than an error you made. Look at the event log for the appropriate failure reason. Reboot the SP to fix the problem.

How consistency groups handle failures

When a failure occurs during normal operations for consistency groups, MirrorView/A lets you perform several actions in order to recover.

When recovering from failures, MirrorView/A achieves three goals:

- Preserves data integrity
- Minimizes the amount of time that data is unavailable to the user
- Ensures that the consistency of the consistency group is maintained

Access to the SP fails

Consider a consistency group that has member mirrors, some of which SP A controls and some of which SP B controls. If SP A on the primary system fails, then software on the attached server, for example, PowerPath, moves control of the mirrors that were controlled by SP A to SP B. This allows applications on the server, as well as the mirroring of data to the secondary system, to continue uninterrupted. However, as part of the transfer of control, the consistency group becomes system fractured. If the recovery policy is set to automatic, an update automatically starts on the surviving SP (SP B in this example). However, if the recovery policy is manual, you must manually start an update.

Primary system fails

If the system running the primary consistency group fails, access to the data in the group's member LUNs is lost. You can either repair the failed system and then continue operations, or you can promote the secondary consistency group, and access the data from the secondary system.

iSCSI-related failure conditions

Table 18 on page 797 shows the iSCSI-related failure conditions and the reasons they occur.

Table 18. iSCSI-related failures

Failure condition	Reason
You selected iSCSI and Fibre Channel connections for the same system and clicked Enable in the **Manage Mirror Connections** dialog box.	You selected iSCSI and fibre connections for the system; you must choose one or the other.
You selected iSCSI for a system already configured to be reached with a Fibre Channel for MirrorView connection.	You tried to connect system A to system B with an iSCSI connection, but a Fibre Channel connection between these two systems already exists. If you want to change from Fibre Channel to iSCSI, you must first disable the Fibre Channel connection to system B.
You selected Fibre Channel for a system already configured to be reached with an iSCSI for MirrorView connection.	You tried to connect system A to system B with a Fibre Channel connection, but an iSCSI connection between these two systems already exists. If you want to change from iSCSI to Fibre Channel, you must first disable the iSCSI connection to system B.

10

EMC VNX MirrorView/S CLI

This chapter introduces the EMC® VNX MirrorView™/Synchronous software and the EMC Navisphere® system management configurations and architecture.

This manual refers to the EMC VNX MirrorView/Synchronous product as MirrorView/S.

Note: If you already familiar with MirrorView/S, you can skip to the next section.

Major topics are:

MirrorView/S overview

EMC® VNX™ MirrorView™/S is a software application that maintains a copy image of a logical unit number(LUN) at separate locations in order to provide for disaster recovery, that is, to let one image continue if a serious accident or natural disaster disables the other. You can quickly restore operations when a catastrophic event, such as a fire, destroys the storage media at the primary data center. By mirroring critical data to a remote site, you not only retain vital data but can also quickly restore operations by switching over to the secondary system. You can configure MirrorView/S over Fibre Channel and iSCSI, but not over Fibre Channel over Ethernet (FCoE).

A remote mirror consists of a primary image and up to two secondary images. The production image (the one mirrored) is called the primary image; the copy image is called the secondary image. MirrorView/S supports up to two remote images, but since you operate on one image at a time, the examples in this manual show a single image. Each image resides on a separate system. The primary image receives I/O from a server called the production server; a separate system maintains the secondary image. This system can optionally have a failover/standby computer connected to it or can be connected to its own computer system. Both systems can be in different domains. The client that is managing the system containing the primary images can fail over to the secondary image if the primary image becomes inaccessible.

MirrorView/S supports MirrorView/S consistency groups, which this manual refers to as *consistency groups*. A consistency group is a set of synchronous mirrors whose secondary images need to be kept consistent with each other in order to be useful; that is, the data on the set of secondary images must have existed on the set of primary images previously. This allows an application to use the secondary images if the primary system fails.

Important: The primary images of mirrors in a MirrorView/S consistency group must reside on a single system, and the secondary images of the mirrors must reside on a single (but different) system. This contrasts with volumes in a Symmetrix® consistency group, which can reside on multiple systems.

Prerequisites

- You must have the MirrorView/S software installed and enabled on all AX4-5 series, CX4 series, CX3 series, and CX series systems you want to participate in a mirror. Configuration guidelines on page 802 provide more information on installing software on the AX4-5 series, CX4 series, CX3 series and CX series systems.
- Data access control must be enabled.
- You must have Unisphere installed and enabled.
- SAN configurations must have qualified switches.
- WAN configurations must have qualified FC-to-IP devices.

Configuration guidelines

The following are configuration rules for MirrorView/S:

- Each mirror must have one primary image and zero, one, or two secondary image. Any single system can have only one image of a mirror.
- A system can have concurrent mirroring connections to a maximum of four other systems. (Mirroring connections are common between synchronous and asynchronous mirrors.)
- The following table lists the configuration limits for the supported platforms.

Platform	CX4-960 systems	CX4-480 system	CX4-240 systems	CX4-120 systems	CX700, CX3 model 40, and CX3 model 80 systems	CX500, and CX3 model 20 systems	AX4-5, CX3 model 10 systems
Primary or secondary mirror images							
Per system	1024	512	256	128	200	100	50
Secondary mirrors per primary	0, 1, or 2						
Primary mirrors with write intent log enabled							
Per system	1024	512	256	128	100	50	25

Note: A metaLUN is a single entity; therefore, it is counted as a single image. For example, if a mirrored metaLUN is composed of five components, it is counted as one image, not five.

The MirrorView/Asynchronous limits are separate from these; see the *EMC MirrorView/Asynchronous Command Line Interface (CLI) Reference*.

- To manage remote mirror configurations, the management workstation must have an IP connection to both the local and remote systems. The connection to the remote system should have an effective bandwidth of at least 128 Kbits/second. The systems can be in different domains.
- MirrorView/S supports the new, larger LUNs that EMC FLARE® supports. (See the FLARE® release notes.)
- MirrorView/S supports thin LUNs only if Navisphere version 6.29.0 containing thin support for MirrorView is installed.
- You cannot combine thin LUNs from CX4 systems running FLARE version 04.29.000.5.xxx or later with pre-FLARE version 04.29.000.5.xxx traditional LUNs or with traditional LUNs from an uncommitted FLARE version 04.29.000.5.xxx. Therefore, you cannot mirror

a thin LUN on a 04.29.000.5.xxx system to a system running a release prior to 04.29.000.5.xxx.

Note: If your system will include FAST Cache (solid state disk drives with flash memory, or SSD drives), be sure to carefully plan your configuration using the *Best Practices and planning* documentation available on EMC Powerlink: Home ➤ Support ➤ Technical Documentation and Advisories ➤ White Papers > Configuration/Administration.

Sample configuration

Figure 11 on page 803 shows a sample remote mirror configuration using either iSCSI networks or Fibre Channel switch fabrics. The configuration has two sites and a primary and secondary image that includes the database of four LUNs.

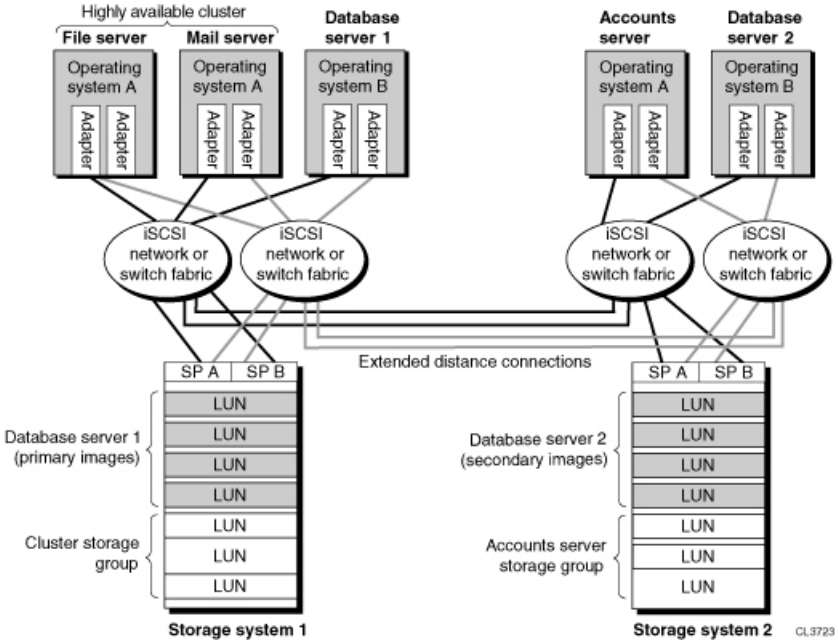


Figure 11. Sample remote mirror configuration

In Figure 11 on page 803, database server 1, which is the production server, executes customer applications. These applications access data on system 1, in the database server storage group. system 2 mirrors the data on the database server storage group. The mirroring is synchronous, so that system 2 always contains all data modifications that are acknowledged by system 1 to the production server.

Note: Storage groups are different from consistency groups, which are described in MirrorView/S consistency group commands on page 858. For more information about storage groups, see the Unisphere online help.

We recommend that you attach a secondary server to system 2, so that if a complete site failure occurs where system 1 and database server 1 are located, you can completely fail over to the secondary site, and thus minimize the outage window. The server at the standby site is not required, but because we recommend it, this example includes it in the overall configuration.

Each server has a path to each SP through each network or fabric to each system. If a failure occurs in a path, software installed on the server (for example, EMC PowerPath® software) switches to the path through the other SP and continues accessing the data, transparent to the applications on the server.

The production server sends a write request to an SP in system 1, which then writes data to the local LUN. The change to the primary LUN is recorded, and at an interval that you define, all changes are copied to the secondary system.

If a failure occurs in system 1, an administrator can use the client that is managing the system to promote the image on system 2 to the role of primary image.

Note: The mirrored data is inaccessible until the secondary image is promoted to a primary image.

Then, the appropriate applications can start on any connected server (here, database server 2) with full access to the data. The mirror can be accessible in minutes, although the time needed for applications to recover will vary.

Note: If you want to create a second secondary image, the configuration requires three systems.

MirrorView connection requirements

MirrorView requires the following:

- One server, connected to one of the systems (a second server, connected to the other system, is optional).
- A Fibre Channel connection (direct or switch) or an iSCSI connection between the two systems, shown on the following pages).

Note: The iSCSI connection is not supported on AX4-5 series systems with FLARE version 02.23.050.5.5xx.

Cable connections between SPs at the MirrorView sites

MirrorView uses a front-end port on each storage processor (SP) as a communication channel between the systems in a remote mirror configuration. This port is called the mirror port in this document.

Table 13 on page 805 shows the mirror ports for the CX4 series systems shipped from the factory without optional I/O modules. The MirrorView ports may vary depending on the type and number of I/O modules in the system. The *EMC Navisphere Command Line Interface (CLI) Reference* explains how to determine the ports available for MirrorView on systems shipped from the factory with optional I/O modules.

Note: For CX4 series systems, the port numbers listed are logical ports; therefore, these CX4 logical port numbers may not be the same as the physical port numbers that Navisphere displays.

Table 19. Mirror ports for the CX4 series systems shipped from the factory without optional I/O modules

System	MirrorView Fibre Channel FE ports		MirrorView iSCSI FE ports	
	Logical port ID	Physical slot and port number	Logical port ID	Physical slot and port number
CX4-120, CX4-240	A-1	slot A0 port 3	A-3	slot A1 port 1
	B-1	slot B0 port 3	B-3	slot B1 port 1
CX4-480, CX4-960	A-3	slot A1 port 3	A-5	slot A4 port 1
	B-3	slot B1 port 3	B-5	slot B4 port 1

Table 14 on page 806 shows the mirror ports for systems other than the CX4 series systems. All port numbers referenced are front-end ports.

Table 20. Mirror ports for systems other than the CX4 series systems

Model	Fibre Channel MirrorView port	iSCSI MirrorView port
CX500	1	N/A
CX700	3	N/A
CX3-10c	3	1[a]
CX3-20, CX3-20f, CX3-40, CX3-40f	1	N/A
CX3-20c, CX3-40c	5	3[a]
CX3-80	3	N/A

Note: For information about determining what your MirrorView port is, see the *EMC Navisphere Command Line Interface (CLI) Reference*.

Although server I/O can share the front-end port with MirrorView, for performance reasons, we strongly recommend that server I/O use the front-end ports that MirrorView is not using.

CAUTION Currently, MirrorView and SAN Copy™ software cannot share the same SP port. Before installing the MirrorView enabler, you must deselect any MirrorView ports that a SAN Copy session is using. Otherwise, any SAN Copy sessions using the MirrorView port will fail.

For MirrorView to work correctly, the SP A mirror port at one site must be connected to the SP A mirror port on the other site and the SP B mirror port at one site must be connected to the SP B mirror port at the other site. The connections can be either direct or through a switch fabric.

Direct remote mirror connections

A direct mirror configuration consists of one primary system and one secondary system. The remote mirror connections must be between:

- SP A mirror ports on the primary and secondary systems
- SP B mirror ports on the primary and secondary systems

Figure 9 on page 807 shows a sample direct remote mirror configuration.

[a] Mirroring over iSCSI is supported for FLARE version 03.26.xxx.5.xxx or later.

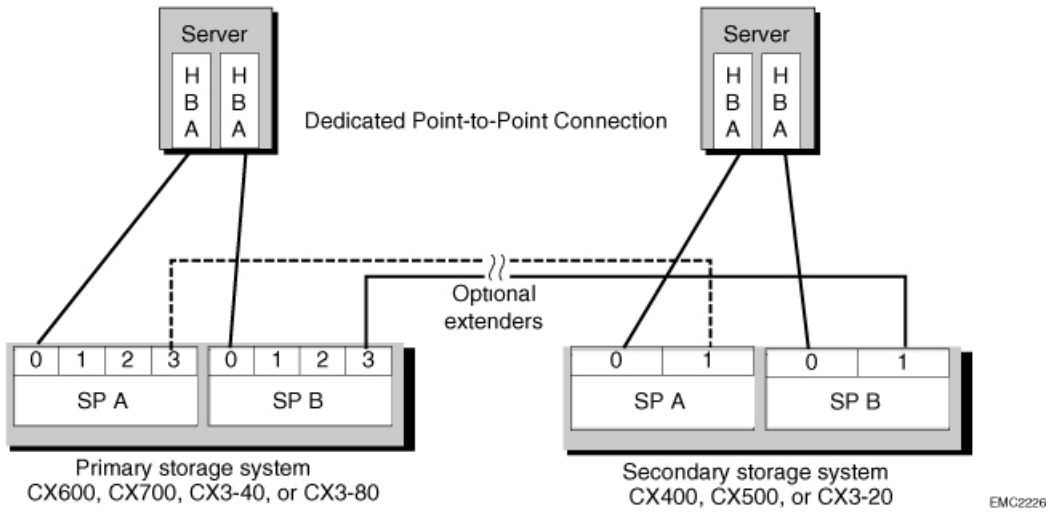


Figure 12. Sample direct remote mirror configuration

Fabric remote mirror connections

A fabric mirror configuration consists of one primary system and up to four secondary systems. The fabric connections must be as follows:

- SP A mirror port on the primary system must be connected to the same switch fabric as the SP A mirror port on the secondary system.
- SP B mirror port on the primary system must be connected to the same switch fabric as the SP B mirror port on the secondary system.

Note: The fabric to which SP A mirror ports are connected can be the same fabric or a different fabric than the one to which the SP B mirror ports are connected.

You must zone the mirror port switch connections as follows:

- A zone for each SP A mirror port on the primary system and the SP A mirror port on each secondary system.
- A second zone for each SP B mirror port on the primary system and the SP B mirror port on each secondary system.

For example, if you have primary system 1 and secondary systems 2 and 3, you need the following two zones:

- Zone 1—SP A mirror port on system 1 and SP A mirror ports on systems 2 and 3.
- Zone 2—SP B mirror port on system 1 and SP B mirror ports on systems 2 and 3.

You can use the same SP port for server data and MirrorView. Be careful when an IP distance connection is used because using the same SP port may cause a degradation in both replication and server application performance.

CAUTION MirrorView and SAN Copy software cannot share the same SP port. Before installing the MirrorView enabler, you must deselect any MirrorView ports that a SAN Copy session is using. Otherwise, any SAN Copy sessions using the MirrorView port will fail.

Figure 10 on page 808 shows a sample remote mirror fabric configuration.

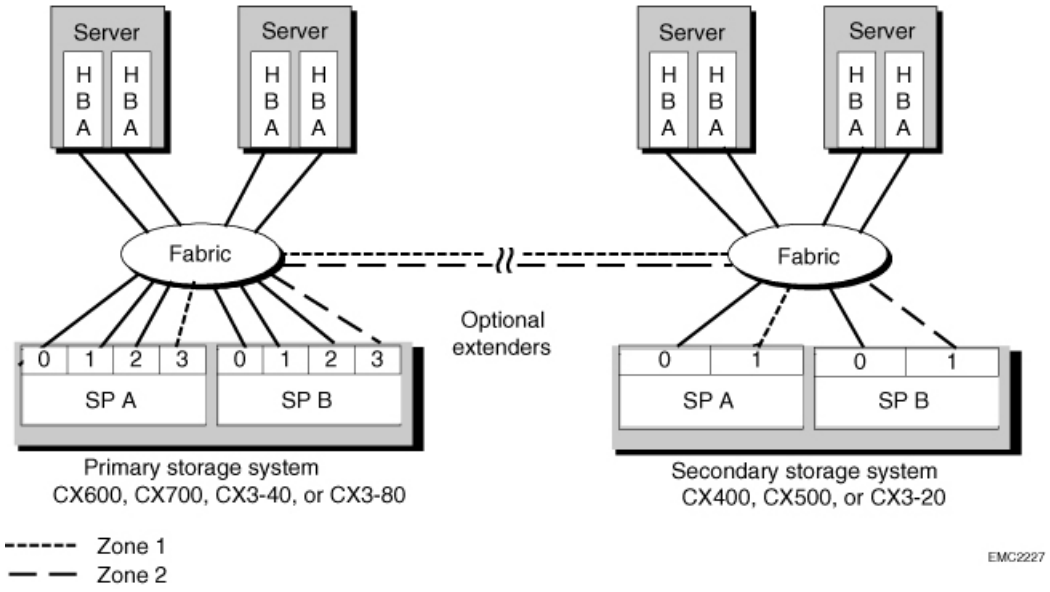


Figure 13. Sample remote mirror connection through a fabric

MirrorView features and benefits

MirrorView mirroring has the following features:

- Provision for disaster recovery with minimal overhead
- VNX® environment
- Bidirectional mirroring
- Integration with EMC SnapView™ LUN copy software
- Integration with EMC SAN Copy software

Provision for disaster recovery with minimal overhead

Provision for disaster recovery is the major benefit of MirrorView mirroring. Destruction of the data at the primary site would cripple or ruin many organizations. After a disaster, MirrorView lets data processing operations resume with minimal overhead. MirrorView enables a quicker recovery by creating and maintaining a copy of the data on another system.

MirrorView is transparent to servers and their applications. Server applications do not know that a LUN is mirrored and the effect on performance is minimal.

MirrorView/S uses synchronous writes, which means that server writes are acknowledged only after all secondary systems commit the data. Most disaster recovery systems sold today use this type of mirroring.

MirrorView is not server-based; therefore, it uses no server I/O or CPU resources. The additional processing for mirroring is performed on the system.

MirrorView environment

MirrorView operates in a highly available environment, leveraging the dual-SP design of VNX. If one SP fails, MirrorView running on the other SP will control and maintain the mirrored LUNs. If the server is able to fail over I/O to the remaining SP, then writes will continue to the primary image and synchronous mirroring of those writes will continue accordingly. The high-availability features of RAID protect against disk failure, and mirrors are resilient to an SP failure in the primary or secondary system.

Bidirectional mirroring

A single system may be primary (that is, hold the primary image) for some mirrors and secondary (that is, hold the secondary image) for others. This enables bidirectional mirroring.

Note: A system can never hold more than one image of a single mirror; that is, it cannot contain both the primary image and secondary image of a single mirror.

Integration with EMC SnapView software

SnapView software lets you create a snapshot of an active LUN at any point in time; however, do this only when the mirror is not synchronizing the secondary image. Since the secondary image is not viewable to any servers, you can use SnapView in conjunction with MirrorView/S to create a snapshot of a secondary image on a secondary system to perform data verification and run parallel processes, for example, backup.

Note: Before starting a SnapView session, make sure that the secondary image is in the synchronized or consistent state. Starting a SnapView session of a secondary LUN when MirrorView/S is synchronizing the secondary LUN will not give consistent data. Also note that data cached on the server, as well as data written to the primary system but waiting to be transferred to the secondary system on the next update, will not be included in the session of the secondary image.

You can clone either a primary or secondary image by creating a clone group on the same LUN as the mirror image and then adding clones to the group. For more information about using SnapView with MirrorView, see the Unisphere help.

Note: The clone of a mirror is not supported on AX4-5 series systems with FLARE version 02.23.050.5.5xx.

Note: Before fracturing a clone or starting a SnapView session, make sure that the secondary image is in the synchronized or consistent state. Fracturing a clone or starting a SnapView session of a secondary LUN when MirrorView/S is synchronizing the secondary system will not give consistent data. Also, note that data cached on the server, as well as data written to the primary system but waiting to be transferred to the secondary system on the next update, will not be included in the replica of the secondary image.

Integration with EMC SAN Copy software

SAN Copy software lets you create an intra- or inter-system copy of a LUN at any point in time. However, do this only when the image state is either Synchronized or Consistent and the mirror is not updating to the secondary image. The copy is a consistent image that can serve for other application purposes while I/O continues to the source LUN. The MirrorView secondary image is not viewable to any servers, but you can use SAN Copy to create a copy of the secondary image on a secondary system to perform data verification and run parallel processes.

Note: Related to the process of making the MirrorView secondary unavailable for server I/O, you cannot run SAN Copy full copy sessions on MirrorView secondary images. You can, however, run SAN Copy incremental sessions on MirrorView secondary images.

For more information about SAN Copy, see the Unisphere online help.

MirrorView/S Remote Mirroring commands

This section explains the **naviseccli** commands and the commands for creating and managing remote mirrors on AX4-5 series, CX4 series, CX3 series, and CX series systems with the MirrorView/S option. These commands let you use MirrorView/S software to create a byte-for-byte copy of one or more local LUNs connected to a distant system server.

Note: The commands in this section function only with a system that has the optional MirrorView/S software installed.

MirrorView/S operations overview

This section provides an overview of MirrorView/S operations and how to manage the systems using the management software.

1. Connect the same management software to both systems and configure the software, so that you can manage both systems.

   Note: Optionally, you can perform this step at the secondary site as well.

   You must manage both systems, which can be in different domains (see the Unisphere online help).

2. If you want to use the write intent log, allocate the LUNs on all participating systems, so that if you promote, the write intent log is enabled.

   In the CLI, to designate the write intent log, use the **mirror -sync -allocatelog** command. You can specify any LUN that can be made a private LUN, that is, any LUN that is not part of a storage group and is not a hot spare.

3. Establish a usable, two-way connection between the MirrorView/S systems using the **mirror -enablepath** command (see mirror -enablepath on page 836).

4. If the primary LUN does not exist, bind it on its server's system. Wait for the LUN to finish binding and add it to the storage group.

5. If the secondary LUN does not exist, create a secondary image LUN.

   Note: The secondary LUN can be a different RAID type from the primary, as long as the block size matches.

6. Wait for the secondary LUN to finish binding.

7. On the host use the CLI to create the mirror using the **`mirror -sync -create`** function. You can specify write intent log information in the command. The **`-create`** function activates the mirror.

8. Create a consistency group and add the primary image to it (optional). See mirror -sync -creategroup on page 859.

9. With the CLI, add the secondary images you need with the **`-addimage`** function. You can list images with the **`mirror -sync -list`** function.

   By default, when you use the **`-addimage`** command, the software starts synchronizing the secondary image with the primary. Unless the source LUN is freshly bound or similarly contains no meaningful data, a full synchronization is necessary.

   If you do not want the default action when you add the image (perhaps because the source LUN is newly bound and synchronizing the mirror to it would be pointless), then you can tell the CLI that synchronization is not required – an option in the **`-addimage`** command.

   After you add the image, all writes to the primary LUN will be duplicated to the secondary LUNs.

   At any time in the previous sequence of steps, you can get remote mirror status with the CLI **`mirror -sync -info`** or **`-list`** command. You can also check the progress of synchronization with the **`-listsyncprogress`** command.

10. If a primary failure occurs, Navisphere reports the failure.

    If the primary failure is minor, have the primary fixed and resume mirroring.

    If the primary failure is catastrophic, the original client that is managing the system may be unusable and thus unable to report the failure. For such a failure, the administrator at the secondary site must set up a client to manage the system (if not already done), then promote the secondary to primary and take other recovery action as needed. This includes assigning the newly promoted LUN to a storage group, if it is not already the appropriate one.

    When you use MirrorView/S on a VMware ESX Server, after you promote the secondary image to a primary image, perform the following steps:

    a. If not already assigned, assign the newly promoted primary image to a storage group on the same or standby ESX Server.

    b. Rescan the bus at the ESX Server level.

    c. If not already created, create a virtual machine (VM) on the same or standby ESX Server. The VM is not powered up when you create it.

    d. Assign the newly promoted primary to the VM.

    e. Power up the VM.

If the VM is created and running and you have not already assigned the newly promoted primary to the VM, perform these steps:

a. Perform steps a and b above.

b. If you are running ESX Server 2.5.x, power it down.

c. To assign the newly promoted primary to the VM, use the virtual center interface for ESX Server 3.x and 2.5.x or the Management User interface for ESX Server 2.5.x.

Note: If you are running ESX Server 3.x, you do not need to power down the VM.

d. If you are running ESX Server 2.5.x, power up the VM.

Note: If you are running ESX Server 3.x, you do not need to power up the VM.

The primary image (which is now the secondary image) will not be accessible to the primary ESX Server.

Note: For configuration restrictions when using VMFS volumes, go to the E-Lab™ Navigator on the EMC Powerlink website, and under the PDFs and Guides tab, open the `VMware ESX server.pdf` file.

11. If access to the secondary storage image fails, the primary system will fracture the remote mirror. If the problem with the secondary is minor (for example, replacing a cable), then the administrator can fix it. Mirroring will recover and resynchronize the image, if the image recovery policy is Automatic.

    Whenever you want to stop mirroring, you can first fracture and remove the secondary images, and then destroy the mirror. This does not affect any data on either image LUN, and access to the primary LUN is also unaffected. The LUN that held the secondary image now becomes accessible as a regular LUN.

MirrorView/S CLI functions

The Navisphere CLI provides one of the two interfaces to the MirrorView/S mirroring software. The Unisphere UI provides the other. You can use the **`naviseccli mirror`** command to set up and manage remote mirror sessions.

The mirror command functions are summarized in Table 21 on page 815.

Table 21. naviseccli MirrorView/S command functions

Essential functions (in order performed)	
mirror -enablepath	Opens a path between the local and remote system. Only a single connection is required for synchronous and/or asynchronous mirroring.
mirror -sync -create	Creates a new remote mirror using an existing LUN. The LUN on which the **-create** command is executed becomes the primary image.
mirror -sync -addimage	Adds a secondary image to a mirror using a LUN on a remote system. Synchronization is optional — if specified, synchronization of the image begins automatically.
mirror -sync -fractureimage	Fractures a secondary image, suspending mirroring of data to that image. A fracture log is maintained, so that the image can be quickly resynchronized later.
mirror -sync -removeimage	Removes a secondary image from a mirror.
mirror -sync -promoteimage	Promotes a secondary image to primary, while simultaneously demoting the primary (if still accessible) to secondary. Required in order to access the data in the secondary image in the event of a failure of the primary.
mirror -sync -syncimage	Starts synchronization of the secondary image with the primary. Needed if automatic recovery is not on. I/O is allowed with the primary while the synchronization occurs. You can specify synchronization rate to avoid serious performance impact.
mirror -sync -destroy	Terminates remote mirroring of a LUN. This does not affect the data in the LUN, and the host continues to access it uninterrupted.
Optional status functions (alphabetically) (see also **getall -mirrorview** in EMC Navisphere CLI Reference)	

Table 21. naviseccli MirrorView/S command functions *(continued)*

Essential functions (in order performed)	
mirror -sync -info	Displays MirrorView/S information about a system.
mirror -sync -list	Displays information about existing mirrors.
mirror -sync -listlog	Displays write intent log information.
mirror -sync -list-syncprogress	Displays the percentage of synchronization.
Optional reconfiguration functions (alphabetically)	
mirror -sync -allocatelog	Allocates LUNs as space for the write intent log. This is optional — it allows recovery through a partial resynchronization if a recoverable failure of the primary SP occurs.
mirror -sync -change	Changes remote mirror properties such as name and description.
mirror -sync -changeimage	Changes secondary image properties such as recovery policy and synchronization rate.
mirror -sync -deallocatelog	Removes the write intent log LUN that was allocated with the **-allocatelog** function. Allowed only when the log is not active.
mirror -disablepath	Severs all paths between the local system SPs and the remote system SPs.
mirror - setfeature	Enables or disables mirroring to/from a LUN. Required in only a few specific cases where the software has insufficient information to do this automatically.

mirror -sync -addimage

Adds an image to a previously created mirror.

PREREQUISITES

You must have a user account on the system on which you want to execute the command.

Note: When you add a secondary image, MirrorView/S automatically allocates and retains additional memory. This additional memory counts against the total replication software memory budget.

DESCRIPTION

This command is used with **naviseccli** (see naviseccli) to add a secondary image to a mirror using a LUN on a remote system. The **-addimage** function is required if you want mirroring to occur. You must direct the command to the system that holds the primary image. This command lets you create primary and secondary images on thin LUNs, if all the participating systems support mirroring on thin LUNs.

Note: The Thin Provisioning™ enabler must be installed to create thin LUNs.

You can use the **-info** function to display the UIDs of systems that have images that can be mirrored.

Note: To add a secondary image, you must have a working connection to the remote system, and the remote LUN must be exactly the same size (number of blocks) as the primary image.

Note: In this syntax "or" means that you can specify the switch, **-arrayhost** *sp-hostname* | **sp-IP-address -lun** *lun-number* | **-lunuid** *lun-uid* or you can specify the switch, **-arrayuid** *system-uid* **-lunuid** *lun-uid*. The rest of the syntax is common to both.

SYNTAX

mirror -sync -addimage -name *name*| **-mirroruid** *mirroruid*
-arrayhost *sp-hostname* **-lun** *lun-number* **-lunid** *lun-uid*
[**-recoverypolicy auto**|**manual**]
[**-syncrate high**|**medium**|**low**] [**-nosynccrequired**]

or

mirror -sync -addimage -name *name* | **-mirroruid** *mirroruid*
-arrayuid *system-uid* **-lunuid** *lun-uid*
[**-recoverypolicy auto**|**manual**]

[**-syncrate high**|**medium**|**low**]
[**-nosynccrequired**]

OPTIONS

-name *name*

Specifies the name that you gave to the mirror with the **-create** command. Use either this name or the mirror unique ID (16-byte world wide name).

-mirroruid *uid*

Specifies the unique 16-byte primary image ID (World Wide Name) the software assigned when the mirror was created. For any letters in the ID, you must specify the same case as the software assigned when the mirror was created (use the function).

-arrayhost *sp-hostname*

Specifies the hostname or network address of the remote SP that will hold the secondary image. The secondary image will be added to the remote mirror connected to this host's SP. Use this switch or **-arrayuid**.

-lun *lun-number*

Specifies the LUN number that will serve as the secondary image of the mirror.

-arrayuid *system-uid*

Specifies the unique 8-byte system ID of the remote SP. You can determine this by using the **mirror -info** command or the **getarrayuid** command (see the *EMC Navisphere Command Line Interface (CLI) Reference*). For any letters in the ID, use the same case that the software assigned when the mirror was created. Use this switch or **-arrayhost**.

-lunuid *lun-uid*

Specifies the unique 16-byte identification number (World Wide Name) of the LUN to be added as a secondary image. If you specified **-arrayuid**, then **-lunuid** is required. If you specified **-arrayhost** , then you can use either **-lun** or **-lunuid**.

Note: When you specify **-arrayuid** and **-lunuid**, you must add the mirror driver on the remote LUN using the **-setfeature** command before executing the **-addimage** command.

-recoverypolicy manual|auto

Specifies the policy for recovering the secondary mirror image after a system fracture. Values are:

manual: The administrator must explicitly start a synchronization operation to recover the secondary mirror image.

auto: Recovery automatically resumes as soon as the primary image determines that the secondary mirror image is once again accessible. This is the default.

-syncrate high|medium|low

Specifies a relative value (low, medium, or high) for the priority of completing updates. High completes updates faster, but may significantly affect system performance for server I/O requests, particularly where there are multiple concurrent synchronizations occurring. Low completes updates much slower, but also minimizes impact on other system operations.

-nosyncrequired

Specifies that synchronization is not needed for the newly added secondary image. The image will not be useful until it is synchronized. If you omit this switch, a synchronization occurs.

EXAMPLE

Any of the following commands adds an image to a mirror. For SP `ss1_spa`, any of the above commands adds to the remote mirror **db_mirror** the LUN in system **50:06:06:10:00:FD:A1:69** (or a LUN on the remote system cpc426) whose unique LUN ID (world wide name, WWN) is **60:06:06:5A:62:02:00:00:92:95:DE:7C:E4:71:D4:11** or whose LUN number is **9**. See also the example in .

```
naviseccli -h ss1_spa mirror -sync -addimage
-name db_mirror -arrayuid 50:06:06:10:00:FD:A1:69
-lunuid 60:06:06:5A:62:02:00:00:92:95:DE:7C:E4:71:D4:11

naviseccli -h ss1_spa mirror -sync -addimage
-name db_mirror -arrayhost cpc426  -lun 9

naviseccli -h ss1_spa mirror -sync -addimage
 -name  db_mirror -arrayhost cpc426
-lunuid 60:06:06:5A:62:02:00:00:92:95:DE:7C:E4:71:D4:11
```

OUTPUT

If the version of FLARE software running on the SP does not support this command, a `Command is not supported` error message is printed to **stderr**. You may also receive other error messages.

mirror -sync -allocatelog

Allocates or re-allocates a LUN for use as a write intent log.

PREREQUISITES

You must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **naviseccli mirror** command with **-allocatelog** assigns a LUN as the write intent log on each SP of the system. The recommended (and minimum) size for the log is 128 MB. The write intent log allows recovery with a partial resynchronization if a recoverable failure of the primary SP occurs. If you do not use the intent log, a full synchronization is always required in the event of a failure of the SP controlling the primary image.

You must specify both SPs in one command line.

SYNTAX

mirror -sync -allocatelog -spA *LUN-number* **-spB** *LUN-number* [**-unbind**] [**-o**]

OPTIONS

-spA *LUN-number* **and -spB** *LUN-number*

Identify the LUN to be used for the write intent log. It must hold at least 128 MB, must not be part of a storage group and must not be a hot spare.

-unbind

If write intent log LUNs are currently defined, unbinds the old LUNs after the write intent log function starts using the new LUNs.

-o

Executes the command without prompting for confirmation.

EXAMPLE

For SP **ss1_spa**, this command allocates as the write intent log for SP A the LUN with ID **122** and for SP B the LUN with ID **124**.

```
naviseccli -h ss1_spa mirror -sync -allocatelog -spA 122 -spB 124
```

OUTPUT

If the version of FLARE software running on the SP does not support this command, a `Command is not supported` error message is printed to `stderr`. You may also receive other error messages.

mirror -sync -change

Changes mirror properties.

PREREQUISITES

You must have a user account on the system on which you want to execute the command.

DESCRIPTION

This command is used with **naviseccli** (see naviseccli) to change one or more parameters of a previously created mirror.

You must direct the command to the system that holds the primary image. You must specify at least one of the optional switches with this command. If you omit the override option, then the CLI displays a message for each parameter to confirm the change.

Note: Always view and modify remote mirror properties from the primary system. Information displayed from the secondary system may not be up to date, especially if the primary system has lost contact with the secondary system.

Note: When you enable the write intent log on a mirror that did not previously use it, MirrorView/S automatically allocates and retains additional memory. This additional memory counts against the total replication software memory budget.

SYNTAX

```
mirror -sync -change -name name | -mirroruid uid
[-newname name]
[-description description]
[-requiredimages num_of_images] [-o]
[-qthresh qthresh] [-usewriteintentlog yes|no]
```

OPTIONS

-name *name*

Specifies the name the **-create** command gave the mirror. You can specify either the mirror name or unique ID (next).

-mirroruid *uid*

Specifies the unique 16-byte remote mirror ID assigned when the mirror was created. For any letters in the ID, you must specify the same case as the software assigned when the mirror was created (use the **mirror -list** command).

-newname *name*

Specifies the new name for the mirror. You can specify up to 32 characters.

-description *description*

Provides a meaningful title for the mirror (for example, Employee and Benefits Table for Human Resources). The software does not use the description to identify the mirror. You can specify up to 256 characters, but we suggest that you should not exceed the line length defined by the operating system.

-requiredimages *num_of_images*

Specifies the minimum number of secondary images that should be accessible to the mirror. The default value is 0. Allowed values are 0, 1, and all. If the number of accessible images goes below the specified value, the mirror goes into the Attention state and generates a log message. You can configure this to generate an appropriate warning (for example, e-mail message or page) to the administrator to enable the administrator to correct the problem.

-qthresh *qthresh*

Specifies the time delay, in seconds, after the last I/O is received before a mirror will automatically be transitioned to the synchronized state. The default is 60 seconds. Valid values are 10-3600.

-usewriteintentlog yes | **no**

Directs the software to use or not use the remote mirror write intent log. If you want to use the log, you must have allocated it with **-allocatelog**.

yes

Use or start using, the write intent log.

no

Do not use, or stop using, the write intent log.

-o

Executes the command without prompting for confirmation.

EXAMPLE

For the remote mirror **dbmirror** on SP **ss0_spa**, this command reduces the minimum number of accessible secondary images to **0**. Use the **-list** command to confirm that the changes were made.

```
naviseccli -h ss0_spa mirror -sync -change -name
dbmirror -requiredimages 0
```

OUTPUT

If the version of FLARE software running on the SP does not support this command, a `Command is not supported` error message is printed to `stderr`. You may also receive other error messages.

mirror -sync -changeimage

Changes secondary image properties.

PREREQUISITES

You must have a user account on the system on which you want to execute the command.

DESCRIPTION

This command is used with **naviseccli** (see naviseccli) to change one or more parameters of a mirror image.

You must direct the command to the system that holds the primary image. You must specify at least one of the optional switches. If you omit the override option, then it displays a message similar to the following for each parameter to confirm the change.

```
Do you want to change the sync rate from Medium to High (y/n)?
```

To change a parameter, enter `y`.

SYNTAX

```
mirror -sync -changeimage -name  name | -mirroruid uid
-imageuid image-uid
[-recoverypolicy manual|auto]
[-syncrate high|medium|low] [-o]
```

OPTIONS

-name *name*

Specifies the name you gave to the remote mirror in the **-create** command. You can specify either the mirror name or uid (next).

-mirroruid *uid*

Specifies the unique 16-byte ID assigned when the mirror was created. For any letters in the ID, you must specify the same case as the software assigned when the mirror was created (use the **mirror -list** command).

-imageuid *image-uid*

Specifies the unique 8-byte ID of the secondary image you want to change. For any letters in the ID, you must specify the same case that the software assigned to the image when the mirror was created (use the **mirror -list** command).

-recoverypolicy manual|auto

Specifies the policy for recovering the secondary mirror image after a system fracture. Values are:

manual: The administrator must explicitly start a synchronization operation to recover the secondary mirror image.

auto: Recovery automatically resumes as soon as the primary image determines that the secondary mirror image is once again accessible. This is the default.

-syncrate high|medium|low

Specifies a relative value (low, medium, or high) for the priority of completing updates. The default is **medium**. High completes updates faster, but may significantly affect system performance for server I/O requests, particularly where there are multiple concurrent synchronizations occurring. Low completes updates much slower, but also minimizes impact on other system operations.

-o

Executes the command without prompting for confirmation.

EXAMPLE

For SP **ss1_spa**, mirror **db_mirror**, image **50:06:06:10:00:FD:A1:6**, this command changes the synchronization rate to high.

```
naviseccli -h ss1_spa mirror -sync -changeimage  -name
db_mirror -imageuid 50:06:06:10:00:FD:A1:6 -syncrate high
```

OUTPUT

If the version of FLARE software running on the SP does not support this command, a `Command is not supported` error message is printed to `stderr`. You may also receive other error messages.

mirror -sync -create

Creates a new mirror using an available LUN for mirroring.

PREREQUISITES

You must have a user account on the system on which you want to execute the command.

Since the write intent log is on by default, before creating a synchronous mirror, you must first allocate the write intent log (see mirror -sync -allocatelog on page 820).

DESCRIPTION

This command is used with **naviseccli** to create a new mirror using an existing LUN. The LUN on which you run the command becomes the primary LUN. But, for mirroring to occur, you must add an image with the **-addimage** function. Later, you can change some of the parameters you specify here with the **-change** function. This command supports thin LUNs after you install the latest Navisphere version, which contains thin LUN support for MirrorView.

If you specify a minimum number of required images (other than the default value zero) in the **-create** command, the mirror will start in the attention state, since you have not yet added the required secondary images. To avoid this problem, do not specify a minimum number of images with **-create**; instead, create the mirror, add the image, and then if you want a minimum number of required images, change the mirror with the **-change** command.

You can use the **-info** command to display the LUN numbers that can be mirrored.

Note: When you create a mirror, MirrorView/S automatically allocates and retains additional memory. This additional memory counts against the total replication software memory budget.

SYNTAX

```
mirror -sync -create -name  name
-lun lun_number
[-description description]
[-requiredimages  num_of_images]
[-qthresh qthresh]
[-nowriteintentlog ]
[-o]
```

OPTIONS

-name *name*

Lets you assign a meaningful name to the mirror; for example "Employee Benefits". To include spaces in the name, enclose the entire string in quotation marks as in the example. You can use this name to manage the mirror. The name can include as many as 32 characters.

-lun *lun_number*

Specifies the LUN number that will serve as the primary image of the mirror you are creating.

-description *description*

Lets you assign a description for the mirror. The software does not use the description to identify the mirror. You can specify up to 256 characters, but we suggest that you should not exceed the line length defined by the operating system.

-requiredimages *num_of_images*

Specifies the minimum number of secondary images that should be accessible to this mirror. The default value is 0. Allowed values are 0, 1, 2, and all. If the number of accessible images goes below the specified value, the mirror goes into the Attention state and generates a log message. You can configure this to generate an appropriate warning (for example, e-mail message or page) to the administrator to enable the administrator to correct the problem.

-qthresh *qthresh*

This specifies the time delay, in seconds, after the last I/O is received before a mirror will automatically transition to the synchronized state. The default is 60 seconds. Valid values are 10-3600.

-nowriteintentlog

Lets you create a synchronous mirror with the write intent log off. When creating a synchronous remote mirror, the write intent log will be on for the mirror by default.

-o

Executes the command without prompting for confirmation.

EXAMPLE # 1

The mirror **-create** command creates the mirror named **db_mirror** on LUN **112**.

```
naviseccli -h ss1_spa mirror -sync -create -name db_mirror -lun 112
```

EXAMPLE # 2

The **-change** command sets a minimum of one secondary image for the mirror.

```
naviseccli -h ss1_spa mirror -sync -change
-name db_mirror -requiredimages 1
```

EXAMPLE # 3

The **-list** command confirms the change.

```
naviseccli -h ss1_spa mirror -sync -list
```

OUTPUT

If the version of FLARE software running on the SP does not support this command, a `Command is not supported` error message is printed to `stderr`. You may also receive other error messages.

mirror -sync -deallocatelog

Removes LUNs from service as write intent log LUNs.

PREREQUISITES

You must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **naviseccli mirror** command with **-deallocatelog** deassigns the LUNs that have been used for the write intent log on this system. This command deallocates the LUNs used by both SPs of the system. The LUNs themselves and their contents are not affected by this command. If at least one mirror is still configured to use the write intent log LUNs, this command will fail with an error message.

If you omit the override option, it displays a message to confirm the deallocation of the intent log:

```
Do you want to deallocate write intent log(y/n)?
```

To deallocate the log for both SPs, answer `y`; to take no action, enter `n`.

SYNTAX

mirror -sync -deallocatelog [**-unbind**] [**-o**]

OPTIONS

-unbind

Directs the software to unbind the LUNs used in write intent logs. (optional)

-o

Executes the command without prompting for confirmation.

EXAMPLE

This command deallocates the LUNs used for the write intent log function on both**ssl_spa** and its peer. This command does not affect the LUNs themselves.

```
naviseccli -h ss1_spa mirror -sync -deallocatelog

Do you want to deallocate write intent log on SP A (y/n)?
```

OUTPUT

If the version of FLARE software running on the SP does not support this command, a `Command is not supported` error message is printed to `stderr`. You may also receive other error messages.

mirror -sync -destroy

Destroys a mirror.

PREREQUISITES

You must have a user account on the system on which you want to execute the command.

DESCRIPTION

This command is used with **naviseccli** (see naviseccli) to destroy a mirror. It is the counterpart of **-create**. It ends mirroring of the LUN that is part of the mirror. This does not affect the data in the LUN, and the server continues to access it.

Note: You cannot destroy a mirror while it is a member of a consistency group.

You must remove the secondary image in the mirror before issuing the command to the system holding the primary image. If you cannot remove the secondary image or access the primary image, you can use the **-force** option. You must direct the command to the system that holds the primary image unless **-force** is specified, in which case, you can direct it to either system.

CAUTION Use **-force** only if all other options to remove an image and the mirror have failed.

If you omit the override option, a message to confirm the destruction of the mirror appears:

```
Do you really want to destroy the mirror <mirror-name> (y/n)?
```

To destroy the mirror, answer `y`; to take no action, enter `n`.

SYNTAX

```
mirror -sync -destroy -name  name | -mirroruid uid
[-force] [-o]
```

OPTIONS

-name *name*

Specifies the name you gave to the mirror with the **-create** command. You can also use the remote mirror ID.

-mirroruid *uid*

Specifies the unique 16-byte remote mirror ID assigned when the mirror was created. For any letters in the ID, you must specify the same case as the software assigned when the mirror was created (use the **mirror -list** command).

-force

Forcibly destroys the mirror. This option affects only the local system.

-o

Executes the command without prompting for confirmation.

EXAMPLE

For SP **ss1_spa**, this command destroys the remote mirror that was created with the name db_mirror.

```
naviseccli -h ss1_spa mirror -sync -destroy db_mirror

Do you really want to destroy the mirror
db_mirror?(y/n)? y
```

OUTPUT

If the version of FLARE software running on the SP does not support this command, a `Command is not supported` error message is printed to `stderr`. You may also receive other error messages if the command fails for some reason.

mirror -disablepath

Disables the communication paths created by **-enablepath** to remote mirror SPs.

PREREQUISITES

You must have a user account on the system on which you want to execute the command.

DESCRIPTION

Use this command with **naviseccli** (see naviseccli on page 35) to sever the path established by **-enablepath** in the remote system.

When issued to any SP, the command severs paths for both SPs in both the primary and secondary systems; that is, it severs these paths if:

- SP A of the local system is connected to SP A of the remote system
- SP A of the remote system is connected to SP A of the local system
- SP B of the local system is connected to SP B of the remote system
- SP B of the remote system is connected to SP B of the local system

This means you can issue the command to either SP of either system to sever the paths between the systems you are targeting.

If you issue the command while a mirror exists, the CLI issues a warning message; if you continue, any mirror connected over the specified path will be fractured.

Note: If both asynchronous and synchronous mirrors are installed, you need to run the command only once. It will take effect for both mirrors.

If you omit the override option, the CLI displays a message to confirm the disabling of the path. To disable the path, answer `y`; to take no action, enter `n`.

SYNTAX

mirror -disablepath *connected-SP-hostname* [**-connectiontype fibre**|**iscsi**] [**-o**]

OPTIONS

connected-SP-hostname

Specifies the hostname of SP A or SP B of a connected system to disconnect.

-connectiontype fibre | iscsi

Specifies the connection type as fibre or iSCSI for the path you are disabling. If you do not specify the **-connectiontype** switch, the system first tries to find a fibre connection; if it does not find one, it looks for an iSCSI connection.

-o

Executes the command without prompting for confirmation. Without this switch, the CLI displays a confirmation message for each SP.

EXAMPLE # 1

For SP **ss1_spa**, this command and confirmation remove the paths between the local SPs and the remote mirror SPs.

```
naviseccli -h ss1_spa mirror -disablepath ss27_spa -connectiontype fibre

Disabling of the path will stop mirroring of data to all

images if any among these arrays. A system fracture of

all mirrors between two arrays on following storage

processors will occur due to this action.

128.221.39.29

10.14.20.154

Do you want to continue (y/n)? y
```

EXAMPLE # 2

The **mirror -info** command displays the updated status.

```
naviseccli -h ss1_spa mirror -sync -info
```

OUTPUT

If the version of FLARE software running on the SP does not support this command, a `Command is not supported` error message is printed to `stderr`.

mirror -enablepath

Establishes a path for remote mirroring between a local and remote system.

PREREQUISITES

You must have a user account on the system on which you want to execute the command.

DESCRIPTION

This command is used with **naviseccli** (see naviseccli on page 35) to create a path between the specified SP and its peer SP to a remote SP and its peer. These paths will serve as paths for remote mirroring. A remote mirror requires a path between the primary and secondary systems.

When issued to any SP, the command creates paths for both SPs in both systems; that is, it creates these paths:

- SP A of the local system to SP A of the other system
- SP A of the other system to SP A of the local system
- SP B of the local system to SP B of the other system
- SP B of the other system to SP B of the local system

The SP As or the SP Bs in both systems must be physically connected.

If you cannot enable paths on one SP due to some error, an informational message appears and the paths are enabled for the other SP. To obtain status information, run the **mirror -info -systems** command.

Note: If both asynchronous and synchronous mirrors are installed, you will need to run the command only once. It will take effect for both mirrors.

SYNTAX

mirror -enablepath *SP-hostname* [**-connectiontype fibre**|**iscsi**]

OPTIONS

SP-hostname

Specifies the hostname of SP A or SP B of the remote system on which you want to enable remote mirroring.

-connectiontype fibre | iscsi

Specifies the connection type as fibre or iSCSI for the path you are enabling. If you do not specify the **-connectiontype** switch, the system first tries to find a fibre connection; if it does not find one, it looks for an iSCSI connection.

Note: To change the connection type, you must first disable the current enabled path. To modify, test, or delete connections or change the credentials, see the *EMC Navisphere Command Line Interface (CLI) Reference.*

EXAMPLE

For SP **ss1_spa**, this command enables the paths between **ss1_spa** and its peer SP and **ss27_spa** and its peer SP. The **mirror -sync -info** command that follows displays the updated status.

```
naviseccli -h ss1_spa mirror -enablepath ss27_spa -connectiontype
iscsi

naviseccli -h ss1_spa mirror -sync -info
```

OUTPUT

If the version of FLARE software running on the SP does not support this command, a `Command is not supported` error message is printed to stderr.

mirror -sync -fractureimage

Fractures an image in a mirror.

PREREQUISITES

You must have a user account on the system on which you want to execute the command.

DESCRIPTION

This command is used with **naviseccli** to start an administrative fracture of a secondary image. It also prevents scheduled updates from starting in the future. You must direct the command to the system that holds the primary image.

(An automatic fracture, called a system fracture, occurs if a secondary image becomes inaccessible to the primary image. After a system fracture, the system periodically tries to communicate with the secondary image and — if it succeeds — starts synchronization based on the fracture log. If you issue the **-fractureimage** command while the mirror is system fractured, the system will not try to communicate or resynchronize until you issue a **-syncimage** command.)

The software displays a message to confirm the fracture:

```
Warning! If the Write Intent Log is not enabled for this mirror, a
full mirror sync of the secondary image will be required in the event
of a failure on the primary image.
Do you want to fracture the image image UID (y/n)?
```

To fracture the mirror, answer `y`; to take no action, enter `n`.

SYNTAX

mirror -sync -fractureimage -name *name* | **-mirroruid** *uid*
-imageuid *uid*
[**-o**]

OPTIONS

-name *name*

Specifies the name you gave to the mirror with the **-create** command.

-mirroruid *uid*

Specifies the unique 16-byte mirror ID (World Wide Name) that the software assigned when it created the mirror. For any letters in the ID, see comments under **-imageuid** below.

-imageuid *uid*

Specifies the unique 8-byte image ID of the secondary image to be fractured. For any letters in the ID, you must specify the same case as the software assigned to the image when the mirror was created (use **mirror -list** function).

-o

Executes the command without prompting for confirmation.

EXAMPLE

For SP **ss1_spa** of the mirror named db_mirror, this command fractures the secondary image with the unique ID shown.

```
naviseccli -h ss1_spa mirror -sync -fractureimage -name
db_mirror  -imageuid  50:06:06:10:00:FD:A1:6

Warning! If the Write Intent Log is not enabled for this
mirror, a full mirror sync of the secondary image will be
required in the event of a failure on the primary image.
Do you really want to fracture the image(y/n)? y
```

OUTPUT

If the version of FLARE software running on the SP does not support this command, a Command is not supported error message is printed to stderr. You may also receive other error messages.

mirror -sync -info

Displays general information about synchronous mirroring in a system.

PREREQUISITES

You must have a user account on the system on which you want to execute the command.

DESCRIPTION

This command, when used with **naviseccli** and no other switches, lists all general information for remote mirror support. Issuing this command with one or more options displays the information based on the option issued. See the example for sample output.

For information on existing mirrors, use the **-list** function. For synchronization status information, use the **-listsyncprogress** function.

SYNTAX

```
mirror -sync -info [-cancreate]
[-maxmirrors]
[-mirroredluns]
[-mirrorableluns]
[-systems [-connectiontype]]
[-logs]
[-all]
```

OPTIONS

-cancreate

Indicates whether an remote mirror can be created in this system: yes or no.

-maxmirrors

Displays the maximum number of mirrors that can be created in this system.

-mirroredluns

Lists the LUN numbers of LUNs that are mirrored in this system. The list includes LUNs used as both secondary and primary images.

-mirrorableluns

Lists LUNs that can be mirrored in this system but are not mirrored at present.

-systems

Lists remote systems that can be used for a secondary image.

-connectiontype

Displays the connection type (fibre or iSCSI) for the enabled mirror. For unexpected error cases, it displays the value, unknown.

-logs

Lists LUNs that are assigned for the write intent log on this system.

-all

Lists all properties of a session without having to type in any other switch.

EXAMPLE # 1

For SP ss1_spa, this command displays potential and current remote mirror information.

```
naviseccli -h ss1_spa mirror -sync -info
Can a mirror be created on this system:YES
Logical Units that are mirrored in Primary Images:82 76
Logical Units that are mirrored in Secondary Images:75 5
72
Logical Units that can be mirrored:10 6 18 74 16 9 85 11
87 77 19 14 250
78 4 15 7 83 17 12 88 100 71 13 89 81
Is Write Intent Log Used: NO
Remote systems that can be enabled for mirroring:
Remote systems that are enabled for mirroring:
Array UID: 50:06:01:60:20:04:A1:6B
Status: Enabled on both SPs
Array UID: 50:06:01:60:90:20:33:54
Status: Enabled on both SPs
Array UID: 50:06:01:60:20:02:C1:A3
Status: Enabled on both SPs
Enabled Connection Type(s): iSCSI
Disabled Connection Type(s): Fibre
Maximum number of possible Mirrors:50
```

EXAMPLE # 2

The following example shows the output for the **mirror -async -info** command for the VNX5300 Block and VNX5500 Block systems.

```
mirror –sync –info –all
```

```
MirrorView port(s):
SP A:
I/O Module Slot:  Onboard
Physical Port ID:  3
Logical Port ID:  3
Port Type:  Fibre
I/O Module Slot:  1
Physical Port ID:  3
Logical Port ID: 5
Port Type:  iSCSI
SP B:
I/O Module Slot:  Onboard
Physical Port ID:  3
Logical Port ID:  3
Port Type:  Fibre
I/O Module Slot:  1
Physical Port ID:  3
Logical Port ID:  5
Port Type:  iSCSI
```

OUTPUT

If the version of FLARE software running on the SP does not support this command, a `Command is not supported` error message is printed to `stderr`.

mirror -sync -list

Displays information about existing mirrors.

PREREQUISITES

You must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **naviseccli -sync mirror** command with **-list** and no other switches lists all information for all mirrors on the system. Issuing this command with one or more options displays the information based on the option(s) issued. You can direct the command to any system; however, only the system holding the primary image of a mirror will always have the latest information about the mirror. Status obtained from other systems may be stale; do not use it unless the primary system is unavailable. See the example for sample output.

For synchronization status information, use the **-listsyncprogress** function.

SYNTAX

```
mirror -sync -list [-name [[name]] [-mirroruid] [uid]
[-description]
[-faulted]
[-images]
[-imagecount]
[-imagesize]
[-lun]
[-qthresh]
[-requiredimages]
[-state]
[-transition]
[-usewriteintentlog]
```

OPTIONS

-name *name*

Specifies the name you gave the mirror with the **-create** function. You can use the mirror name or unique ID to obtain information on a mirror.

-mirroruid *uid*

Specifies the unique 16-byte remote mirror ID (World Wide Name) the software assigned when it created the mirror.

-description

Lists the meaningful title for the mirror, if any. The software does not use the description to identify the mirror.

-faulted

Lists whether the remote mirror is faulted: yes or no. If it is faulted, the mirror is either fractured or in the attention state.

-images

Displays image information, such as the role of the image (primary or secondary), image ID, WWN of the LUN containing the image, recovery policy, sync rate, image state, image condition, and image transitioning.

-imagecount

Lists the current number of images that compose the mirror. This count includes the primary image.

-imagesize

Lists the size of the image (capacity of the LUN containing the image) in user blocks.

-lun

Lists the LUN number of the local image.

-qthresh

Lists the time delay, in seconds, after the last I/O is received before a mirror will automatically transition to the synchronized state. The default is 60 seconds.

-requiredimages

Lists the minimum number of secondary images required for the mirror.

-state

Describes the operational state of the mirror. Values are: inactive, active and attention.

-transition

Specifies whether the mirror is in a changing state.

-usewriteintentlog

Lists whether the mirror uses the write intent log. You cannot use the log unless you first allocate it.

EXAMPLE

```
naviseccli -h ss1_spa mirror -sync -list
```

```
MirrorView Name: pbc sync on 82
MirrorView Description:
MirrorView UID:
50:06:01:60:90:20:29:85:01:00:00:00:00:00:00:00
Logical Unit Numbers: 82
Remote Mirror Status: Mirrored
MirrorView State: Active
MirrorView Faulted: YES
MirrorView Transitioning: NO
Quiesce Threshold: 60
Minimum number of images required: 0
Image Size: 204800
Image Count: 2
Write Intent Log Used: NO
Images:
   Image UID: 50:06:01:60:90:20:29:85
   Is Image Primary: YES
   Logical Unit UID:
60:06:01:60:57:A0:0E:00:56:7D:92:1C:37:73:D8:11
   Image Condition: Primary Image
   Preferred SP: A
Image UID: 50:06:01:60:90:20:33:54
Is Image Primary: NO
Logical Unit UID:
60:06:01:60:B7:7C:0E:00:02:DB:F3:EF:36:73:D8:11
Image State: Consistent
Image Condition: System fractured
Recovery Policy: Automatic
Preferred SP: A
Synchronization Rate: Medium
Image Faulted: YES
Image Transitioning: NO
Synchronizing Progress (%): N/A
```

OUTPUT

If the version of FLARE software running on the SP does not support this command, a `Command is not supported` error message is printed to `stderr`. You may also receive other error messages.

mirror -sync -listsyncprogress

Displays the percentage of synchronization that has occurred.

PREREQUISITES

You must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **naviseccli mirror** command with **-listsyncprogress** and no other switches lists all information for all remote mirrors. Issuing this command with one or more options displays the information based on the option included.

If you omit arguments, the CLI displays information on all mirrors.

You must direct the command to the system that holds the primary image; if not, the progress will display as `N/A`. Similarly, if an image is synchronized, the progress will display as `100`. See the example for sample output.

SYNTAX

mirror -sync -listsyncprogress [**-name** *name* | **-mirroruid** *uid*]

OPTIONS

-name *name*

Specifies the name given to the mirror with the **-create** command. You can use the mirror name or unique ID to obtain information on a particular mirror.

-mirroruid *uid*

Specifies the 16-byte mirror unique ID (world wide name) assigned when the mirror was created. If you specify this switch, information on the particular mirror appears.

EXAMPLE

```
naviseccli -h ss1_spa mirror -sync -listsyncprogress


MirrorView Name: pbc sync on 82
Has Secondary Images: YES
Image UID: 50:06:01:60:90:20:33:54
Image State: Consistent
Synchronizing Progress(%): N/A
```

```
MirrorView Name:  pbc sync on LUN 75
Has Secondary Images: YES
Image UID: 50:06:01:60:90:20:29:85
Image State: Out-of-Sync
Synchronizing Progress(%): N/A
```

OUTPUT

If the version of FLARE software running on the SP does not support this command, a `Command is not supported` error message is printed to `stderr`. You may also receive other error messages.

mirror -sync -listlog

Displays write intent log information.

PREREQUISITES

You must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **`naviseccli mirror`** command with **`-listlog`** lists the write intent log LUN numbers. If a write intent log is not allocated, then it displays nothing. You can direct this command to any system that has MirrorView/S installed.

Format of the display is:

`SP:A/B`

`LUN-number` (Number of LUN used as write-intent log)

SYNTAX

`mirror -sync -listlog`

EXAMPLE

For both **`ss1_spa`** and its peer SP, this command lists the write intent log LUN information. If the write intent log is allocated, example output may be as follows:

```
naviseccli -h ss1_spa mirror -sync -listlog


Storage Processor: SP A
LUN Number: 129
Storage Processor: SP B
LUN Number: 128
```

OUTPUT

If the version of FLARE software running on the SP does not support this command, a `Command is not supported message` is written to `sterr`.

mirror -sync -promoteimage

Promotes a secondary image to primary.

PREREQUISITES

You must have a user account on the system on which you want to execute the command.

DESCRIPTION

This command promotes a secondary image to the role of the primary image. The command is successful if it can promote the secondary to a primary that is server-accessible. You must direct this command to a system that holds the secondary image — never to the system that holds the primary. The command will fail if you issue it to the system that holds the primary image.

You can promote a secondary image if the secondary is in a synchronized or consistent state. If the original primary is available, the software does a full resynchronization unless it confirms that the two images were synchronized.

Use **-promoteimage** carefully. The software will prompt for confirmation as follows before processing the command:

```
Warning! This command is a very powerful and unforgiving command like
formatting a disk. An improper use of this command can create
unexpected results. If you have not done any of the following steps
then answer 'n' and fulfil these steps and re-issue the command. Did
you put primary image in a quiescent state? Is image synchronized? It
does not have to be synchronized but it is better to be synchronized
to avoid any kind of loss of data. Do you want to continue (y/n)?
```

Answering **yes** will continue with processing of promote command. Answering **no** stops the command execution.

When you promote a secondary image to primary, the software assigns a new mirror UID to the promoted image to distinguish it from the old mirror. The new status of the old primary image depends on whether the old primary image is accessible when promotion occurs:

- If the original primary image is not accessible when you issue the promote command, the software creates a new mirror with the original secondary image as the primary image, and the original primary is not part of the new mirror. If the original mirror had a second secondary, it is added as a secondary to the new mirror if it is accessible. If the original primary image becomes available later, you should destroy the original mirror using the Unisphere **force destroy**, or Navisphere CLI **mirror -sync -destroy -force** option. After destroying the original mirror, you can (if desired) add the LUN that held the original primary image to the new mirror as its secondary image. This secondary image requires a full synchronization before it provides data protection.

- If the original primary is accessible when you issue the promote command, then the promoted image becomes primary and the original primary becomes secondary (that is, the images swap). The software then tests to see if the two images are *synchronized*. If it finds the images are *synchronized*, then it proceeds with mirrored I/O as usual. If the mirror is not in the *synchronized* state, then the mirror will be out-of-sync and waiting on admin. The recovery policy is changed to manual during the promotion, so that you must initiate the synchronization. If you choose to synchronize the mirror, it will be a full synchronization.

Note: A promotion changes the mirror's recovery policy to manual.

After promoting an image, you must explicitly add the newly promoted image to an appropriate storage group. EMC recommends that you also remove the old primary from its storage group, if possible.

Note: You cannot issue this command on a mirror that is part of a consistency group.

Note: Promoting when I/O is going to the primary image can cause data loss. Any I/Os in progress during the promotion may not be recorded to the secondary image and will be unavailable after the secondary image is promoted. It will also probably require a full synchronization of the new secondary image after the promotion.

In normal operation when there is no failure, you can (but probably would not want to) promote a secondary image. If you do so, the primary image is demoted to secondary. The new primary image inherits the mirror properties of the demoted primary image. Before issuing this command consider the following:

- If possible, the secondary image should be synchronized (synchronized state) with the primary image. If the secondary image is in the consistent state (not synchronized state) when you promote it to primary image, data will probably be lost during the promotion process.

  The secondary image to be promoted must be in a consistent or synchronized state. If the secondary image is out-of-sync or synchronizing, then you cannot promote it; an error will result.Also, a full synchronization of data is required from the new primary to the original one if the image is not synchronized when the promotion occurs.

- You must stop I/O to an accessible primary image before you issue this command. If I/O continues to the original primary, data may be lost as the software demotes the primary to secondary and/or an SP may reboot unexpectedly during the attempted promotion.
- If the primary system has a write intent log, ensure that the secondary system does also.

SYNTAX

```
mirror -sync -promoteimage -name name | -mirroruid uid
-imageuid imageuid
[-o]
```

OPTIONS

-name *name*

Specifies the name you gave the mirror with the **-create** command. You can use the mirror name or unique ID to promote a secondary image.

-mirroruid *uid*

Specifies the unique 16-byte mirror ID (World Wide Name) that was assigned when the mirror was created. For any letters in the ID, see comments under **-imageuid** below.

-imageuid *uid*

Specifies the unique 8-byte image ID of the secondary image you want to promote. For any letters in the ID, you must specify the same case as the software assigned to the image when it created the mirror (use the **mirror -list** function).

-o

Runs the command without prompting for confirmation.

EXAMPLE

For SP **ss1_spa**, the owner of the remote mirror named **db_mirror**, this command promotes the secondary image with the unique ID shown.

```
naviseccli -h ss1_spa mirror -sync -promoteimage
-name db_mirror -imageuid 50:06:06:10:00:FD:A1:6
```

OUTPUT

If the version of FLARE software running on the SP does not support this command, a `Command is not supported` error message is printed to `stdout`. You may also receive other error messages.

mirror -sync -removeimage

Removes a secondary image from a mirror.

PREREQUISITES

You must have a user account on the system on which you want to execute the command.

DESCRIPTION

This command is used with **naviseccli** to remove a secondary image from the remote mirror. You must issue this command to a system that holds the primary image.

An image can be removed even if it is an active image. However, you can remove a secondary image only if it is in the synchronized state or you have fractured the mirror.

If you omit the **-override** option, the software displays a message to confirm the remove operation:

```
Removing of the image will stop mirroring of data to the specified
image. It may cause the minimum number of images required parameter
to be violated that will cause the mirror to go into attention state.
Do you really want to remove the image(y/n)?
```

Answering yes will remove the image.

Note: You cannot issue this command on a mirror that is part of a consistency group.

SYNTAX

mirror -sync -removeimage -name *name* | **-mirroruid** *mirroruid*
-arrayhost *sp-hostname* | **-imageuid** *imageuid* [**-o**]

OPTIONS

-name *name*

Specifies the name you gave the mirror with the **-create** command. You can use the mirror name or unique ID to remove a secondary image.

-mirroruid *uid*

Specifies the unique 16-byte remote mirror ID (World Wide Name) assigned when the software created the mirror. For any letters in the ID, see comments under **-imageuid** below.

-arrayhost *sp-hostname*

Specifies the hostname or network address of the remote SP that holds the secondary image you want to remove. If you specify this switch, the driver(s) from the secondary LUN stack is removed.

-imageuid *image-uid*

Specifies the unique 8-byte image ID of the secondary image you want to remove. For any letters in the ID, you must specify the same case as the software assigned to the image when it created the mirror (use the **mirror -list** command). If you specify this switch, you must explicitly remove the driver(s) from the secondary LUN stack using the **-setfeature** command.

-o

Executes the command without prompting for confirmation.

EXAMPLE

For SP address **ss1_spa**, the owner of the mirror named `db_mirror`, this command removes the image with the unique ID shown.

```
naviseccli -h ss1_spa mirror -sync -removeimage
-name db_mirror -imageuid 50:06:06:10:00:FD:A1:6

Removing the image will stop mirroring of data to the
specified image. It may cause the minimum number of
images required parameter to be violated that will cause
the mirror to go into attention state. Do you really want
to remove the image (y/n)? y
```

OUTPUT

If the version of FLARE software running on the SP does not support this command, a `Command is not supported` error message is printed to `stderr`. You may also receive other error messages.

mirror -sync -setfeature

Adds or removes an synchronous mirror driver to or from the LUN stack.

PREREQUISITES

You must have a user account on the system on which you want to execute the command.

DESCRIPTION

Use this command with **naviseccli** (see naviseccli) to add the synchronous mirror driver to or remove it from the LUN stack depending on whether you specify the **-on** or **-off** option. You must issue this command to the system where the LUN resides.

This command is required after you remove a secondary image from a mirror, using the **-imaguid** switch to specify the image. In this case, Navisphere has insufficient information to automatically remove the MirrorView/S driver from the stack of the secondary image LUN, and you must use this command to do this manually.

Note: When you add a synchronous mirror driver to the LUN stack using the **-on** switch, MirrorView/S automatically allocates and retains additional memory. This additional memory counts agains the total replication software memory budget.

SYNTAX

mirror -sync -setfeature -on | **-off -lun** *lun_number* | **-lunuid** *uid*

OPTIONS

-on

Adds the driver to the LUN stack.

-off

Removes the driver from the LUN stack.

-lun *lun_number*

Specifies the LUN number to which you want to add or from which you need to remove the driver.

-lunuid *uid*

Specifies the unique 16-byte identification number (World Wide Name) of the LUN to which you will add the driver or from which you will remove the driver.

EXAMPLE

For SP **ss1_spa**, this command starts adding the driver to LUN 112.

```
naviseccli -h ss1_spa mirror -sync -setfeature -on
-lun 112
```

OUTPUT

If the version of FLARE software running on the SP does not support this command, a `Command is not supported` error message is printed to `stderr`. You may also receive other error messages.

mirror -sync -syncimage

Starts an update of the secondary image.

PREREQUISITES

You must have a user account on the system on which you want to execute the command.

DESCRIPTION

Use this command with **naviseccli** (see naviseccli) to begin the synchronization operation on a secondary image that was previously administratively fractured or on one where the mirror image condition is normal. You must issue this command to the system that holds the primary image. The secondary image should be fractured when performing this operation. If you specify a secondary image that is not fractured, an internal error message will be returned.

If **-o** is not specified, the software displays a message asking you to confirm:

```
During synchronization, array performance will be impacted and data
is vulnerable to a failure of the primary image. Do you want to sync
the image (y/n)?
```

Answering y will start synchronization.

Note: You cannot issue this command on a mirror that is part of a consistency group.

SYNTAX

mirror -sync -syncimage -name *name* | **-mirroruid** *mirroruid* **-imageuid** *imageuid* [**-o**]

OPTIONS

-name *name*

Specifies the name given to the mirror with the **-create** command. You can use the mirror name or unique ID to update a secondary image.

-mirroruid *uid*

Specifies the unique 16-byte remote mirror ID (World Wide Name) assigned when the software created the mirror. For any letters in the ID, see comments under **-imageuid** below.

-imageuid *imageuid*

Specifies the unique 8-byte image ID of the secondary image you will synchronize. For any letters in the ID, you must specify the same case as the software assigned to the image when the software created the mirror (use the **mirror -list** command).

-o

Executes the command without prompting for confirmation.

EXAMPLE

For SP **ss1_spa**, the owner of the mirror named **db_mirror**, this command starts synchronizing the image with the unique ID shown.

```
naviseccli -h ss1_spa mirror -sync -syncimage
-name db_mirror -imageuid 50:06:06:10:00:FD:A1:6

During synchronization, array performance will be
impacted and data is vulnerable to a failure of the
primary image. Do you want to sync the image (y/n)? y
```

OUTPUT

If the version of FLARE software running on the SP does not support this command, a `Command is not supported` error message is printed to `stderr`. You may also receive other error messages.

MirrorView/S consistency group commands

This section explains the commands for creating and managing groups of mirrors on CX4 series, CX3 series, CX series, and AX4-5 series systems with the EMC MirrorView/S option. This section refers to groups of mirrors as *consistency groups*.

Note: The LUNs in a MirrorView/S consistency group must reside on the same system, unlike the volumes in a Symmetrix consistency group, which can reside on multiple systems.

mirror -sync -creategroup

Establishes a consistency group to which you can later add mirrors.

PREREQUISITES

You must have a user account on the system on which you want the command executed.

DESCRIPTION

This command is used with **naviseccli** to create a consistency group to which you can add mirrors with subsequent commands. You must direct the command to the system on which you are creating the MirrorView/S group.

Note: On AX4-5, CX500, CX3 model 10, and CX3 model 20 systems, you can have 8 consistency groups, and each consistency group can have up to 8 mirrors. On CX700, CX3 model 40, and CX3 model 80 systems, you can have 16 consistency groups, and each consistency group can have up to 16 mirrors. On CX4 systems, you can have 64 consistency groups, which can be a combination of synchronous and asynchronous consistency groups. For example, if you have 4 asynchronous consistency groups, the maximum number of synchronous consistency groups you can create is 60. On CX4-120 and CX4-240 systems, each consistency group can have up to 32 mirrors. On CX4-480 and CX4-960 systems, each consistency group can have up to 64 mirrors.

When you create a consistency group, MirrorView/S automatically allocates and retains additional memory. This additional memory counts against the total replication software memory budget.

SYNTAX

```
mirror -sync -creategroup -name name
[-description description]
[-recoverypolicy policy][-o]
```

OPTIONS

-name *name*

Specifies the name of the consistency group. Use only alphanumeric characters for the consistency group name. The name can be up to 32 characters.

-description *description*

Specifies a textual description of the consistency group.

-recoverypolicy *policy*

Specifies the policy for recovering the mirrors in a group after a failure causes a system fracture. Values are:

manual: Update of the secondary image does not begin until you explicitly issue a **synchronize** command.

auto: Update of the secondary image automatically begins as soon as the connection between the two systems is again operational.

-o

Executes the command without prompting for confirmation.

EXAMPLE

For SP `ss1_spa`, this command creates a consistency group with the name **dbgroup**.

```
naviseccli -h ss1_spa mirror -sync -creategroup -name dbgroup
```

OUTPUT

If the version of FLARE software running on the SP does not support this command, a `Command is not supported` error message is printed to `stdout`. You may also receive other error messages.

mirror -sync -destroygroup

Destroys a consistency group.

PREREQUISITES

You must have a user account on the system on which you want to execute the command.

DESCRIPTION

This command is used with **naviseccli** (see naviseccli) to destroy a consistency group. It is the counterpart of **-creategroup**.

Note: Make sure that the consistency group is empty before destroying it.

If you omit the override option, the system displays a message to confirm the destruction of the consistency group:

```
Do you really want to destroy the group <group-name>? (y/n)?
```

To destroy the consistency group, answer `y`; to take no action, enter `n`.

SYNTAX

mirror -sync -destroygroup -name *name* | **-groupid** *id*
[**-force**] [**-o**]

OPTIONS

-name *name*

Specifies the name you gave the mirror with the **-creategroup** command. You can also use the consistency group ID.

-groupid *id*

Specifies the consistency group unique ID assigned when the consistency group was created.

-force

Destroys the consistency group even if it is not empty. Force destroy destroys only the group on the local system; you must also destroy the group on the other system.

-o

Executes the command without prompting for confirmation.

EXAMPLE

For SP `ss1_spa`, this command destroys the consistency group that was created with the name **`dbgroup`**.

```
naviseccli -h ss1_spa mirror -sync -destroygroup dbgroup

Do you really want to destroy the group dbgroup?(y/n)? y
```

OUTPUT

If the version of FLARE software running on the SP does not support this command, a `Command is not supported` error message is printed to `stdout`. You may also receive other error messages if the command fails.

mirror -sync -addtogroup

Adds a mirror to a previously created consistency group.

PREREQUISITES

You must have a user account on the system on which you want to execute the command.

DESCRIPTION

This command is used with **naviseccli** (see naviseccli) to add one mirror at a time to a consistency group.

Note: The mirror you specify must have its primary image on the system. No two secondary images of mirrors in the consistency group can be on different systems.

When you add a mirror to a consistency group, MirrorView/S automatically allocates and retains additional memory. This additional memory counts against the total replication software memory budget.

SYNTAX

```
mirror -sync -addtogroup -name  name | -groupid id
-mirrorname name | -mirroruid id
```

OPTIONS

-name *name*

Specifies the name of the consistency group to which you want to add the mirror.

-groupid *id*

Specifies the unique ID of the consistency group to which you want to add the mirror.

-mirrorname *name*

Specifies the name of the mirror you want to add to the consistency group.

-mirroruid *id*

Specifies the World Wide Name of the mirror you want to add to the consistency group.

EXAMPLE

For SP `ss1_spa`, this command adds the mirror, **`Sales Accounts Mirror to Europe`**, to the consistency group, **`dbgroup`**.

```
naviseccli -h ss1_spa mirror -sync -addtogroup
-name dbgroup -mirrorname "Sales Accounts Mirror to Europe"
```

OUTPUT

If the version of FLARE software running on the SP does not support this command, a `Command is not supported` error message is printed to `stdout`. You may also receive other error messages.

mirror -sync -removefromgroup

Removes a mirror from a consistency group.

PREREQUISITES

You must have a user account on the system on which you want to execute the command.

DESCRIPTION

This command is used with **naviseccli** (see naviseccli) to remove one mirror at a time from the consistency group.

Note: The mirror you specify must have its primary image on the system. This does not apply if you use the **-force** switch.

If you omit the **-o** option, the software displays a message to confirm the remove operation. Answering yes will remove the mirror.

SYNTAX

```
mirror -sync -removefromgroup -name name | -groupid id
-mirrorname name | -mirroruid id[-force] [-o]
```

or

```
mirror -sync -removefromgroup -name name | -groupid id
-localLunUid uid | -localLunnumber number[-force] [-o]
```

OPTIONS

-name *name*

Specifies the name of the consistency group from which you want to remove the mirror.

-groupid *id*

Specifies the unique ID of the consistency group to which you want to add the mirror.

-mirrorname *name*

Specifies the name of the mirror you want to remove from the consistency group.

-mirroruid *id*

Specifies the World Wide Name of the mirror you want to remove from the consistency group.

-localLunUid *uid*

Specifies the world wide name of the local LUN belonging to the local image, which participates in the consistency group. You can use this switch to remove group members only in the failure scenario.

-localLunnumber *number*

Specifies the LUN number of the local LUN belonging to the local image, which participates in the consistency group. You can use this switch to remove group members only in the failure scenario.

Note: Failure scenarios may occur where a mirror may no longer exist, but is still considered to be a member of the consistency group. In this case, the consistency group is in an incomplete state. A mirror can be missing from the consistency group if the promotion fails between destroying the original mirror and creating a new one. In this case, all the properties of the missing mirrors, except the **local LUN uid** and **local LUN number** appear as **unknown** in the **-listgroups** command. You can remove the mirror from the consistency group only by specifying the group name or group ID and the local LUN uid or local LUN number. Use the local LUN uid or local LUN number only in this failure case. Removing a regular mirror in a group by specifying **-locallunnumber** or **-locallunuid** returns an error. Removing the missing mirror by specifying the **-mirrorname** or **-mirroruid** also returns an error.

If a mirror is missing only on the secondary side, then issuing the **removefromgroup** command on the primary side will remove the missing member on the secondary side also.

-force

Removes the mirror even if the connection with the remote system is not functioning. If you direct this command at the secondary system with this switch, only the secondary member is removed; the primary system is not contacted.

-o

Executes the command without prompting for confirmation.

EXAMPLE

For SP **ss1_spa**, the owner of the consistency group named **dbgroup**, this command removes the mirror with the unique ID shown.

```
naviseccli -h ss1_spa mirror -sync -removefromgroup
-name dbgroup -mirroruid

83:5A:20:90:60:01:06:50:01:00:00:00:00:00:00:00
```

OUTPUT

If the version of FLARE software running on the SP does not support this command, a `Command is not supported` error message is printed to `stdout`. You may also receive other error messages.

mirror -sync -changegroup

Changes consistency group properties.

PREREQUISITES

You must have a user account on the system on which you want to execute the command.

DESCRIPTION

This command is used with **naviseccli** to change one or more parameters of a consistency group.

You must specify at least one of the optional switches. If you omit the override option, then it displays a message similar to the following for each parameter to confirm the change.

```
Do you want to change the group synchronization rate from Medium to
High (y/n)?
```

To change a parameter, enter `y`.

SYNTAX

```
mirror -sync -changegroup -name name | -groupid id
[-newname newname]
[-description description]
[-recoverypolicy policy] [-o]
```

OPTIONS

-name *name*

Specifies the name of the consistency group you want to change. You can specify either the consistency group name or ID (next).

-groupid *id*

Specifies the unique ID of the consistency group you want to change.

-newname *newname*

Specifies the new name of the synchronous consistency group. The name can be up to 32 characters. You can change the name, but not the ID.

-description *description*

Specifies a textual description for the consistency group.

-recoverypolicy *policy*

Specifies the policy for recovering the mirrors in a group after a failure causes a system fracture. Values are:

manual: Update of the secondary image does not begin until you explicitly issue a **synchronize** command.

auto: Update of the secondary image automatically begins as soon as the connection between the two systems is again operational.

-o

Executes the command without prompting for confirmation.

EXAMPLE

For system `ss1_spa`, consistency group `dbgroup`, this command automatically starts synchronization.

```
naviseccli -h ss1_spa mirror -sync -changegroup -name
dbgroup -recoverypolicy auto
```

OUTPUT

If the version of FLARE software running on the SP does not support this command, a `Command is not supported` error message is printed to `stdout`. You may also receive other error messages.

mirror -sync -syncgroup

Synchronizes all members of the consistency group.

PREREQUISITES

You must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **naviseccli mirror -sync** command with **-syncgroup** synchronizes all members of a consistency group. When one member of the group is fractured, all will be fractured; therefore, it is necessary to synchronize the group. You cannot synchronize an individual image whose primary image is part of a consistency group. The **-syncgroup** command returns successfully that all members of the consistency group have been queued for synchronization.

SYNTAX

mirror -sync -syncgroup -name *name* | **-groupid** *id*
[**-o**]

OPTIONS

-name *name*

Specifies the name of the consistency group you want to update or synchronize. You can specify either the consistency group name or id (next).

-groupid *id*

Specifies the unique ID of the consistency group you want to update or synchronize.

-o

Executes the command without prompting for confirmation.

EXAMPLE

For SP `ss1_spa`, the owner of the consistency group named `dbgroup`, this command starts synchronizing the consistency group.

```
naviseccli -h ss1_spa mirror -sync -syncgroup -name dbgroup
```

OUTPUT

If the version of FLARE software running on the SP does not support this command, a `Command is not supported` error message is printed to `stdout`. You may also receive other error messages.

mirror -sync -fracturegroup

Fractures all image(s) in a consistency group.

PREREQUISITES

You must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **naviseccli mirror -sync** command with **-fracturegroup** starts an administrative fracture of all images in the consistency group, even if they are already system fractured. You must direct this command to the primary system.

SYNTAX

```
mirror -sync -fracturegroup -name name | -groupid id
[-o]
```

OPTIONS

-name *name*

Specifies the name of the consistency group you want to fracture. You can specify either the consistency group name or ID (next).

-groupid *id*

Specifies the unique ID of the consistency group you want to fracture.

-o

Executes the command without prompting for confirmation.

EXAMPLE

For SP **ss1_spa**, with the consistency group named **dbgroup**, this command fractures all the images in the consistency group.

```
naviseccli -h ss1_spa mirror -sync -fracturegroup
-name dbgroup
```

OUTPUT

If the version of FLARE software running on the SP does not support this command, a `Command is not supported` error message is printed to `stdout`. You may also receive other error messages.

mirror -sync -promotegroup

Promotes all secondary images in a consistency group to primary images.

PREREQUISITES

You must have a user account on the system on which you want to execute the command.

Before promoting, perform the following steps:

1. Stop all I/O.
2. If possible, make sure that the group is in a synchronized state.
3. Before running a force promote, first perform a normal promotion and, if possible, fix any error conditions that it returns.

CAUTION After force promoting a consistency group that is out-of-sync after the promotion, use caution before synchronizing the consistency group. If the group was fractured before the promotion, the new primary system may have data that is much older than the original primary (now secondary) system. Synchronizing the group may overwrite newer data on the original primary system.

DESCRIPTION

This command promotes all secondary images to the role of the primary images. You must direct this command to a secondary system. This command is used with **naviseccli** (see naviseccli).

Note: To promote a consistency group, the group on the secondary side must be Consistent or Synchronized. When the primary system is not reachable, the group may not be in a Consistent or Synchronized state.

CAUTION Promoting when I/O is going to the primary image can cause data loss. Any I/Os in progress during the promotion may not be recorded to the secondary image and will be unavailable after the secondary image is promoted. It will also probably require a full synchronization of the new secondary image after the promotion.

SYNTAX

```
mirror -sync -promotegroup -name name | -groupid id
[-type type] [-o]
```

OPTIONS

-name *name*

Specifies the name of the consistency group you want to promote. You can specify either the consistency group name or ID (next).

-groupid *id*

Specifies the unique ID of the consistency group you want to promote.

-type *type*

Specifies the type of promotion. Values are:

normal (default), which promotes each mirror in the consistency group. Otherwise, it will destroy the original mirrors and create new ones with the targeted secondaries as primaries and the original primaries as secondaries.

local, which creates only the new primary image. If the original primary system can be contacted, then the secondary image is removed from the mirror on the original primary system. Thus, both systems will have a mirror with primary images only.

force, which continues the promotion despite most errors that may occur. We recommend that before using force promote, first use normal promote and, if possible, fix any errors that it returns.

-o

Runs the command without prompting for confirmation.

EXAMPLE

For SP **ss1_spa**, the owner of the consistency group named **dbgroup**, this command promotes all secondary images:

```
naviseccli -h ss1_spa mirror -sync -promotegroup -name
dbgroup
```

OUTPUT

If the version of FLARE software running on the SP does not support this command, a `Command is not supported` error message is printed to `stdout`. You may also receive other error messages.

mirror -sync -listgroups

Displays information about existing consistency groups.

PREREQUISITES

You must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **naviseccli mirror -sync** command with **-listgroups** and no other switches lists all information for all synchronous consistency groups on the system. Issuing this command with one or more options displays the information based on the option(s) issued. This command is used with **naviseccli** (see naviseccli).

SYNTAX

```
mirror -sync -listgroups [-name[name]] [-groupid[-id]]
[-feature][-state][-role][-mirrors]
[-condition][-recoverypolicy][-canbeaddedtogroup]
```

OPTIONS

-name *name*

Specifies the name of the consistency group whose information you want to display. If you do not specify the name of the consistency group with this switch, that piece of information will be provided for the consistency group(s) being displayed.

-groupid *id*

Specifies the unique ID of the consistency group whose information you want to display.

-feature

Displays the maximum number of consistency groups allowed on the system and the maximum number of members per consistency group.

-state

Displays Synchronized, Out-of-Sync, Synchronizing, Consistent, Scrambled, Incomplete, Local Only, or Empty.

-role

Displays Primary, Secondary, or Unknown.

-mirrors

Displays the mirror name, mirror uid, the IDs of both images in the pair, and the system ID of the paired image.

-condition

Displays the consistency group condition as Active, Admin Fractured, System Fractured, Waiting on Sync, Inactive, or Invalid.

-recoverypolicy

Displays either manual or automatic to describe whether the system will wait for you to restart updates in the event of a system fracture, after the problem is corrected.

-description

Displays the description associated with the consistency group.

-canbeaddedtogroup

Displays all the mirrors that you can add to a group. A mirror appears in the list only if it is consistent or synchronized and not fractured. Also, the consistency group must be in-sync or consistent and not fractured.

EXAMPLE

```
naviseccli -h 10.14.5.200 mirror -sync -listgroups


Maximum Number of Groups Allowed: 16
Maximum Number of Mirrors per Group: 16

Group Name: vid
Group ID: 50:06:01:60:90:60:2D:03:00:00:00:00
Description:
State: Synchronized
Role: Secondary
Condition: Active
Recovery Policy: Manual
Mirror Name: vid
Mirror WWN:
50:06:01:60:90:60:2C:BA:01:00:00:00:00:00:00:00
Primary WWN: 50:06:01:60:90:60:2C:BA
Secondary WWN: 50:06:01:60:90:60:2D:03
Array hosting remote image: 50:06:01:60:90:60:2C:BA
Local LUN ID:
60:06:01:60:8B:53:10:00:A0:FF:D5:30:DE:B4:D8:11
Local LUN Number: 0
Remote LUN ID:
60:06:01:60:90:53:10:00:A3:58:04:80:DE:B4:D8:11
Mirrors can be added to group:
Mirror Name: djp1
Mirror WWN:
50:06:01:60:90:60:2C:BA:03:00:00:00:00:00:00:00
```

OUTPUT

If the version of FLARE software running on the SP does not support this command, a `Command is not supported` error message is printed to `stdout`. You may also receive other error messages.

Responding to failures

This section describes how MirrorView/S and consistency groups handle failures.

Access to the primary SP fails

If an SP that owns mirrored LUNs on the primary system fails, MirrorView/S on the other SP takes ownership of those mirrored LUNs by trespassing them when something on the server (like PowerPath) initiates the trespass. This allows mirroring to continue, provided the server is set up properly to handle the failover (for example, a Windows server with PowerPath). When the primary LUN is trespassed, MirrorView/S sends a trespass request to any secondary images when the next update starts. Therefore, you may notice that the mirrored LUNs on the secondary system have moved from SP A to SP B, or vice versa. MirrorView/S keeps the SP ownership the same on the primary and secondary systems during updates. If the primary image is on SP A, then the secondary image will be on SP A. This may not occur until the start of the next update.

Primary image fails

If the system controlling the primary image fails, access to the mirror stops until you either repair the system or promote a secondary image of the mirror to primary. If the mirror has two secondary images and you promote one, the other secondary image becomes a secondary image to the promoted mirror.

You can recover with a promotion, or you can wait until the primary image is repaired and then continue where you left off.

Promoting a secondary image to primary

In situations where you must replace the primary system due to a catastrophic failure, you can use a promotion to access data on the secondary system. To recover and restore I/O access, you must promote a secondary mirror image to the role of primary mirror image, so that a server can access it.

Note: You can also promote a secondary image even if there has not been a catastrophic failure.

If the primary image and secondary image can communicate with each other, then when the secondary image is promoted, the former primary image is demoted to a secondary image.

To promote a secondary image, the following conditions must be true:

- You must direct the **`naviseccli mirror`** commands to the system holding the secondary image.

- The state of the secondary image you will promote must be either Consistent or Synchronized.

Note: If you promote a consistent secondary image, you must perform a full synchronization to re-establish the mirror after promotion.

CAUTION Promoting when I/O is going to the primary image can cause data loss. Any I/Os in progress during the promotion may not be recorded to the secondary image and will be unavailable after the secondary image is promoted. It will also probably require a full synchronization of the new secondary image after the promotion.

In a failure situation, before promoting a secondary image to a primary image:

- If the existing primary image is accessible, remove the primary image from any storage groups before promoting the secondary image to avoid I/O and therefore inconsistent data.
- Ensure that no I/O, either generated from a server or by an update in progress, is occurring in the mirror.
- If the existing primary is available, make sure that it lists the secondary image that is to be promoted as "synchronized."

To promote a secondary image to a primary image:

1. Issue the **`mirror -sync -promoteimage`** command. See
2. Add the newly promoted image to a storage group if necessary.

If you have two secondary images, the other secondary will also be added to the new mirror if it can be contacted. If there are two secondary images and one is promoted, but the other secondary cannot be contacted, then the other secondary remains part of a mirror for which there is no primary image. You must remove this orphaned image by using the **`force destroy`** option.

At some point later, you can also perform the following steps:

1. Verify that the failed system is not the master of the domain.

   If it is, assign another system to be the master. See the *EMC Navisphere Command Line Interface (CLI) Reference.*

2. Verify that the failed system is not a portal.

   If it is a portal, remove the portal and configure a different system as a portal. See the *EMC Navisphere Command Line Interface (CLI) Reference*.

Note: If a planned promotion of a secondary (for example, for disaster recovery testing) occurs, make sure that the image you are promoting is in the synchronized state to avoid a full resynchronization.

Starting MirrorView/S on a running VMware ESX Server

When you use MirrorView/S on a VMware ESX Server, after you promote the secondary image to a primary, perform the following steps:

1. Assign the newly promoted primary image to a storage group of the same or standby ESX Server.
2. Rescan the bus at the ESX Server level.
3. Create a Virtual Machine (VM) on the same or standby ESX Server.
4. Assign the newly promoted primary to the VM. Assign it to a different VM unless you remove the failed primary, in which case you can assign it to the same VM.
5. Power up the VM.

After you finish

If the VM is created and running, perform these steps:

1. Power it down.
2. Use the Service Console on the ESX Server to assign the newly promoted primary to the powered-down VM.
3. Power up the VM.

The primary image (which is now the secondary image) will not be accessible to the primary ESX Server.

Recover by promoting a secondary image

When you promote the secondary image, the software assigns a new mirror ID to the promoted image to distinguish it from the original mirror, even though the mirrors have the same name. The new image condition of the original primary image depends on whether the original primary image is accessible at the time of promotion.

If the existing primary image is accessible when you promote, the software attempts to add the original primary image as a secondary image of the promoted mirror; that is, the images swap roles.

If the primary image is not accessible when you promote, the software creates a new mirror with the former secondary image as the new primary image and no secondary image, as shown in the example below. The mirror on the original primary system does not change. If the MirrorView/S connection between the systems is not working during a promotion, the system that holds the original primary image still has a record of the secondary image that was promoted. The original primary image is unable to communicate with the promoted secondary image even if the MirrorView/S connection between the systems is restored (since the secondary was promoted to a primary image).

Mirror before promotion	Mirror after promotion
mirror ID = aaa primary image = LUN xxxx secondary image = LUN yyyy	mirror ID = bbb secondary image = LUN yyyy primary image = none

Restore the original mirror configuration after recovery of a failed primary image

If the original mirror becomes accessible following a failure and the mirror's secondary image has been promoted, the original mirror will be unable to communicate with the new one. To restore your mirrors to their original configuration, use the following process. Note that this process overwrites the contents of the original primary LUN. If you want to retain any data on the original primary LUN, copy it to another LUN before continuing or alternatively, you can create a LUN that will become the primary LUN.

1. Remove the original primary LUN from any storage groups of which it is a member.

2. Destroy the original mirror using the **`mirror -sync -destroy -force`** command.

Original mirror	New mirror
Original mirror is destroyed. Original LUN used for primary image remains (LUN xxxx)	primary image = LUN yyyy secondary image = none

CAUTION Data from the promoted LUN will overwrite all the data on the secondary image (original primary) LUN if the administrator synchronizes the mirror.

3. Add a secondary image to the new mirror using the LUN that was the primary image for the original mirror.

   Data from the promoted LUN will overwrite all the data in the secondary image (original primary) LUN.

   The secondary image starts synchronizing automatically.

4. Synchronize the secondary image.

New mirror
primary image = LUN yyyy secondary image = LUN xxxx

5. Allow the image to transition to the Synchronized state following the synchronization.

   If the image is in the Consistent state when you promote it, another full resynchronization is required, and data may be lost.

6. Promote the secondary image in the new mirror to primary.

   The new mirror has the same configuration as the original mirror.

New mirror
primary image = LUN xxxx secondary image = LUN yyyy

   During a promotion, the recovery policy for a secondary image is always set to manual. This prevents a full synchronization from starting until you want it to.

7. If required, reset the recovery policy back to automatic.

Recover without promoting a secondary image

If the primary system fails, but can be readily repaired, recovery is simpler. MirrorView/S records any writes that had been received before the failure and can transfer them to the remote image when the primary system is repaired, thus synchronizing the secondary with the primary. Any writes that were sent to the system but that are not yet acknowledged may be lost, but application-specific recovery techniques, such as **`chkdsk`** or **`fsck`** for file systems, can usually correct any issues. If you did not use the write intent log, you must perform a full resynchronization of the secondary image.

To recover without promoting a secondary image, follow these steps:

1. Repair the primary system and/or server.
2. Fracture the mirror(s).
3. Complete any necessary application-specific recovery of the data on the primary image.
4. Make sure that the data is flushed from the server to the system.
5. Synchronize the mirror(s).

11

SAN Copy and its command line utilities

This chapter introduces the EMC® SAN Copy™ software and its command line utilities: admhost, with commands that the operating system uses to manage SAN Copy devices; and the CLI, with commands that manage SAN Copy sessions. Major topics are:

Introducing SAN Copy software

EMC SAN Copy software (referred to as SAN Copy later in this document) runs on a SAN Copy system (system with SAN Copy software enabled). It copies data between block systems, within block systems, between block and Symmetrix systems, and between block and qualified non-EMC systems. SAN Copy can copy data directly from a source logical unit on one system to destination logical units on other systems, without using host resources. SAN Copy connects directly or through a SAN, and also supports protocols that let you use the IP WAN (wide area network) to send data over extended distances. SAN Copy can perform multiple copies—each in its own copy session—simultaneously. The RAID type of the logical units participating in a copy session does not have to be the same; that is, the source and destination logical units can be different RAID types.

You can use SAN Copy to create full and incremental copies of a source logical unit. An incremental session copies only the data that has changed since the last copy session. This can significantly reduce the time needed to copy the data, thereby allowing the copy operation to be performed more frequently and more effectively. Unlike full copy sessions, the source logical unit for an incremental session can remain online during the copy process. You must, however, prepare the source logical unit prior to starting the session (see Preparing logical units for a SAN Copy session on page 917). Regardless of the type of copy session—full or incremental—the participating logical units must meet certain requirements.

You can use SAN Copy for the following tasks:

- One-time data migration
- Routine copying of data for application testing
- Content distribution
- Scheduled updates to multiple databases

To manage SAN Copy sessions, you can use either the UI-based Unisphere (described in the Unisphere online help), or the SAN Copy command line interface described in this manual.

SAN Copy features and benefits

The SAN Copy software adds value to customer systems by offering the following features:

- A system-based data mover application that uses a SAN rather than host resources to copy data resulting in a faster copy process.
- An easy-to-use, web-based application for configuring and managing SAN Copy.
- Software that you can use in conjunction with replication software, allowing I/O with the source logical unit to continue during the copy process.
- Simultaneous sessions that can copy data to multiple Block and Symmetrix systems.
- Incremental SAN Copy sessions that copy only the data that has changed since the last update.
- Integration with EMC SnapView software.
- Integration with EMC MirrorView™ software.

System-based data-mover application

SAN Copy is a system-based data-mover application that uses a SAN or LAN (local area network) to copy data between systems. Since SAN Copy runs on the systems, this eliminates the need to move data to and from the attached hosts and reserves host processing resources for users and applications. Since the host is not involved in the copy process, and the data migration takes place on the SAN, the copy process is much faster than the LAN-based, host-involved copy process.

Easy-to-use web-based application

SAN Copy is an integrated part of Unisphere, the easy-to-use, web-based management tool for systems. Unisphere lets you select the SAN Copy source and destination logical units, create SAN Copy sessions and then manage these sessions.

Use with replication software

If the system containing the source logical unit has device replication technology, such as EMC SnapView or EMC TimeFinder® software, SAN Copy can use a snapshot (full copy sessions only), clone, or Symmetrix BCV (business continuation volume) as its source logical unit — allowing I/O with the source logical units for the snapshot, clone, or BCV to continue during the copy process.

You must fracture a SnapView clone before using it as a source LUN in a SAN Copy session. For more details, refer to the SnapView documentation and online help.

Simultaneous sessions between multiple systems

SAN Copy lets you have more than one session active at a time. The number of supported concurrent active sessions and the number of logical units per session depends on the system type.

If the destination logical unit is a metaLUN, the metaLUN is considered a single entity. Therefore, the metaLUN counts as one of the maximum destination logical units. For example, if a metaLUN consists of five LUNs, it counts only as one destination logical unit, not five.

System type	Maximum number of concurrent sessions per system	Maximum number of destination logical units per session
CX4-240, CX4-120, CX3 model 20 systems, CX500, CX400	8 (4 per SP)	50
CX3 model 40 systems	8 (4 per SP)	100
CX4-960, CX4-480, CX3 model 80 system, CX700, CX600	16 (8 per SP)	100
CX3 model 10 systems, AX4-5 series systems	4 (2 per SP)	50

Incremental SAN Copy sessions

The incremental SAN Copy feature lets you copy only the data that has changed since the last copy session. This significantly reduces the time needed to copy the data, thereby allowing the copy operation to be performed more frequently and more effectively. Unlike full copy sessions, the source logical unit can remain online during the copy process.

To use the incremental SAN Copy feature:

- The source logical unit must reside in a SAN Copy system. (This system cannot be a CX300 system or an AX series system running Navisphere Express).
- The source logical unit cannot be a SnapView snapshot.
- You must configure the reserved LUN pool (refer to the EMC Unisphere online help).

Integration with EMC SnapView software

SnapView can be used with SAN Copy to create a snapshot or a clone of the destination LUN, so that the SnapView replica can be put in the secondary server storage group, rather than the SAN Copy destination logical unit. This allows the SAN Copy destination logical unit to maintain consistency with its source, and be available on an ongoing basis for incremental updates. SAN Copy tracks server writes to the SAN Copy source LUN (for example, from the production server); but SAN Copy does not track server writes to the SAN Copy destination LUN (for example, from the secondary server).

Integration with EMC MirrorView software

SAN Copy software lets you create an intra- or inter-system copy of a LUN at any point in time; however, do this only when the image state is either synchronized or consistent and the mirror is not updating to the secondary image. The copy is a persistent image that can serve for other application purposes while I/O continues to the source LUN. The MirrorView secondary image is not viewable to any hosts, but you can use SAN Copy to create a copy of the secondary image on a secondary system to perform data verification and run parallel processes.

Related to the process of making the MirrorView secondary image unavailable for host I/O, you cannot run SAN Copy full copy sessions on MirrorView secondary images. You can, however, run SAN Copy incremental sessions on MirrorView secondary images.

For more information on MirrorView, refer to the EMC Unisphere online help.

SAN Copy software components

SAN Copy consists of the following software components:

- SAN Copy software installed and enabled on a SAN Copy system.

  Note: All CX series (excluding the CX300), CX3 series, and CX4 series systems ship from the factory with SAN Copy software installed, but not enabled. To use the SAN Copy software functionality, the SAN Copy enabler must be installed on the system.

- The admhost utility provides a command line executable that lets you execute certain commands — **`lun_activate`**, **`lun_deactivate`**, **`lun_flush`**, and **`lun_list`** when managing SAN Copy sessions. The admhost utility ships with other Windows host utilities (for example, the host agent and CLI), and resides on any Windows hosts connected to systems that have the SAN Copy software installed and enabled.
- User interface (UI) – Unisphere, which must be installed on at least one system on the same network as the SAN Copy system.

  Note: CX4 series, CX3 series, CX300, CX500, and CX700 systems ship from the factory with Unisphere installed and enabled. CX200, CX400, and CX600 systems ship from the factory with Unisphere installed, but not enabled. To use the Unisphere functionality on a CX200, CX400, or CX600 system, the Unisphere enabler must be installed on the system.

- Navisphere command line interface (CLI), which ships as part of the Unisphere Host Agent packages.

SAN Copy operations overview

Depending on your needs, go to one of the following chapters:

- For information about the basic requirements, restrictions and configuration guidelines for using SAN Copy — SAN Copy Configuration Guidelines
- To learn about admhost commands — Using the Admhost Utility with SAN Copy
- To learn about SAN Copy CLI commands — SAN Copy CLI Commands

The following steps explain how to use SAN Copy:

1. Set up SAN Copy. This procedure includes the following tasks:
   - Zoning switches — see Fibre Channel zoning requirements and recommendations on page 897.
   - Registering SAN Copy ports — see Preparing a Block system for a copy session on page 905 and Preparing a Symmetrix system for a copy session on page 909.
   - Adding logical units to storage groups and connecting ports to storage groups and volumes — see Preparing a Block system for a copy session on page 905 and Preparing a Symmetrix system for a copy session on page 909.
   - Configuring the reserved LUN pool for incremental SAN Copy sessions — see the *Navisphere Command Line Interface Reference*.

2. On the SAN Copy system, create full or incremental SAN Copy copy descriptors using the **`sancopy -create`** or **`sancopy -create -incremental`** command (see sancopy -create on page 922).

3. Prepare the source and destination logical units for a SAN Copy session (see Preparing logical units for a SAN Copy session on page 917).

4. For full sessions, proceed to step 5 to start the session.

   For incremental sessions, mark any sessions using the **`sancopy -mark`** command (see sancopy -mark on page 942).

   Note: Once you receive confirmation that the mark operation was successful, you can make the source logical units available to the host and resume I/O to these logical units. This applies only to source logical units participating in incremental copy sessions.

   ---

5. On the production host's system, start the SAN Copy sessions using the **`sancopy -start`** command (see sancopy -start on page 961).

Note: More than one session at a time per source logical unit can be active on a host, provided the source and destination logical units are unmounted (see step 3 above).

6. Let the copy session complete.

7. On both hosts, make the source logical unit (if not done previously) and destination logical units available to the operating system.

Note: Some operating systems do not support access by the same host to identical LUNs. Therefore, once SAN Copy completes the copy session, we recommend that you move any identical LUNs to different storage groups.

With Windows hosts, issue the **admhost lun_activate** command. This command rescans the bus for new devices and assigns a drive letter to all Block and Symmetrix logical units that do not already have one. Use the **-l** and **-d** options with the **admhost lun_activate** command to assign a drive letter to a LUN with a specific World Wide Name (WWN).

SAN Copy configuration requirements

This section describes the configuration requirements and restrictions for copying data between Block systems, between Block and Symmetrix systems, and within systems. Figure 1 shows a sample SAN Copy session that includes these configurations.

Support for thin LUNs

SAN Copy sessions support thin LUNs in the following configurations:

- Within a system running committed FLARE® version 02.29.xx.yy.z or later
- Between systems running committed FLARE version 02.29.xx.yy.z or later
- With certain limitations, systems running committed FLARE version 02.29.xx.yy.z or later (must be the SAN Copy system) and systems running earlier versions of FLARE

Copying data between Block systems or Block and Symmetrix systems

If you will be copying data between Block systems, or between Block and Symmetrix systems, the requirements in the following sections must be met before you start a SAN Copy session.

Note: For full copy sessions, a virtual disk in an AX series system can be either a source or a destination logical unit. For incremental sessions, it can be only a destination logical unit.

All copy sessions

Both full and incremental copy sessions must meet the following requirements. In addition, incremental sessions must meet the requirements described in Copying data between Block systems or Block and Symmetrix systems on page 893:

- One of the Block systems participating in the copy session must be a SAN Copy system.
- You must enable the VCM bit on all Symmetrix storage ports participating in the SAN Copy session.
- For Fibre Channel replication, you must correctly zone SAN Copy initiator ports to remote systems so that SAN Copy can have access to these systems (see Fibre Channel zoning requirements and recommendations on page 897).

  For iSCSI replication, you must create connection sets. A connection set is a named set of information used by a Block iSCSI initiator to establish a replication session with an iSCSI target. A connection set consists of a unique user-defined name, method for assigning security credentials (connection specific, array-shared or none), one or

more connection paths, and when specified, an optional username and password (secret).

Note: SAN Copy ports act as host initiators to the remote systems. You can add them to storage groups and they must belong to the same zone as the logical units participating in the copy session.

- Either the source logical unit, destination logical units or both must reside in a SAN Copy system.

Note: If the source logical unit resides in the SAN Copy system, you can copy data to one or many destination logical units on one or many systems. None of the remote systems require the SAN Copy software.

If the source logical unit does not reside in the SAN Copy system, all destination logical units must reside in the system that owns the SAN Copy session.

- When copying data to a Symmetrix system, use the **`navicli -lunmapinfo`** command to obtain the World Wide Name (WWN) of any Symmetrix volumes that you want to include in the SAN Copy session. These volumes must be mounted and the Unisphere Host Agent must be installed on the hosts that own the volumes. For the required host agent version, refer to the SAN Copy release notes, available on the EMC Powerlink® website (see Preface in the Preface).
- In order for the logical units to participate in a SAN Copy session, you must make the logical units accessible to the participating SAN Copy system port. For example, when copying between Block systems, you must add the initiator port to the storage group on the remote system that includes the participating destination logical units.

Note: For AX series systems, refer to the Navisphere Express online help for instructions on making virtual disks accessible to the SAN Copy port.

For Symmetrix systems, refer to your Symmetrix documentation for instructions on making volumes accessible to the SAN Copy port.

Incremental copy sessions

Incremental copy sessions must meet all the requirements for full sessions with the following exceptions and additions:

Exception

- The source logical unit cannot reside in a remote system. It must reside in the SAN Copy system.
- The source logical unit cannot be a SnapView snapshot.

Additions

- You must configure the reserved LUN pool before you start an incremental SAN Copy session. The reserved LUN pool works with SAN Copy to perform incremental SAN Copy operations. It consists of one or more private LUNs. Before starting an incremental SAN Copy session, the pool must contain at least one LUN for each source LUN that will be participating in an incremental session. For more information, see the Unisphere online help, packaged with the software and available from Powerlink.

Copying data between LUNs within a Block system

If you will copy data from one LUN to one or many LUNs within the same Block system, the following requirements must be met before you start a SAN Copy session:

Note: You do not need to zone Fibre Channel connections or create iSCSI connection sets when you are copying data within a system.

- The system must be a SAN Copy system.
- The source and all destination LUNs participating in a copy session must belong to the same SP.

  Note: If you need to copy between LUNs owned by different SPs, you must trespass either the source or destination LUNs before starting the session.

- For incremental copy sessions:
  - The source logical unit cannot be a SnapView snapshot.
  - You must configure the reserved LUN pool before you start an incremental SAN Copy session. For more information, see the Unisphere online help, packaged with the software and available from Powerlink.

Sample SAN Copy configuration

Figure 14 on page 896 shows a sample SAN Copy configuration that includes a SAN Copy system on the left, and a remote system on the right (either a Block or Symmetrix system). LUNs 1, 2, 3, and 4 reside in the SAN Copy system and LUNs 5 and 6 reside in the remote system.

Within the SAN Copy system, the data on LUN 1 is being copied to LUN 2. LUNs 1 and 2 must belong to the same SP, and no zoning is required.

An incremental copy session is copying the data on LUN 4 to LUN 6. LUN 4 (the source LUN) must reside in a SAN Copy system. Since the source logical unit is on the SAN Copy system, SAN Copy is able to copy LUN 4's data to many destination LUNs on many systems.

A full copy session is copying the data on LUN 5 to LUN 3. Since the source LUN (LUN 5) does not reside in a SAN Copy system, all the destination LUNs for LUN 5 must reside in the same SAN Copy system.

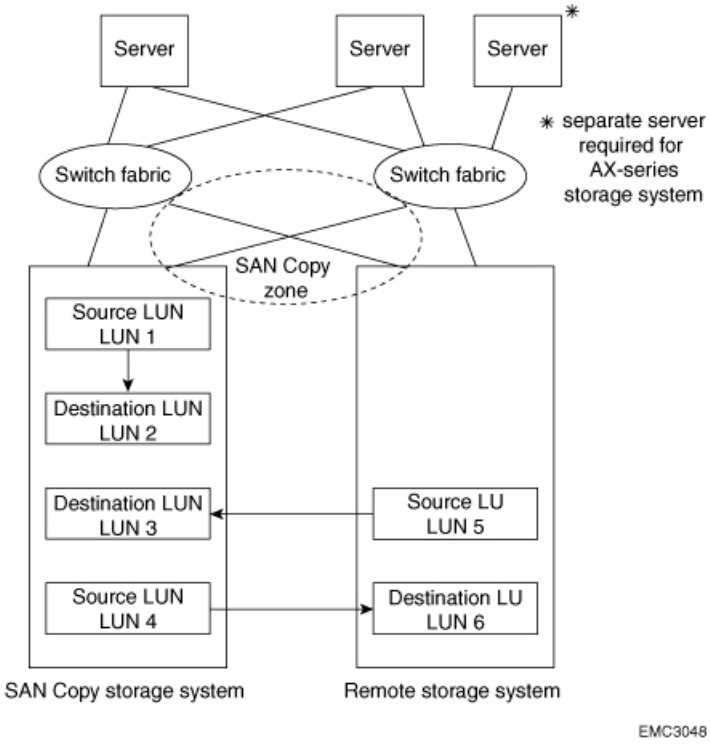


Figure 14. Sample SAN Copy configuration

Fibre Channel zoning requirements and recommendations

Note: Zoning is not required for copying data between LUNs within a system. SAN Copy software does not support configurations where a SAN Copy port is zoned to a system that is not supported by SAN Copy software. Refer to the EMC Support Matrix (ESM) or SAN Copy release notes for a list of supported systems.

Currently, SAN Copy and MirrorView software cannot share the same SP port (refer to the SAN Copy release notes for confirmation).

Each port in a SAN Copy system is a dual-mode port. When the port is participating in a SAN Copy session, it acts as an initiator to the remote systems and any other SAN Copy ports in the same zone. When the host initiators are using the port to transfer I/O, the port acts as a target to the host initiator. Each time a host initiator registers with the SAN Copy port or the SAN Copy port registers with another SP port, the SAN Copy port consumes a login resource. If you consume all login resources for the SAN Copy port, the SAN Copy session may not successfully complete on all destination logical units. We recommend that you follow the single initiator to single remote SP port rule when creating and configuring SAN Copy zones — include only one SAN Copy port (initiator) and only one remote SP port in each zone. For examples of single initiator zoning, refer to Single-initiator zoning examples without and with SAN Copy installed on page 901.

Zoning recommendations

You can create a variety of SAN Copy zoning configurations. We recommend that you configure your zoning so that:

- There are redundant connection paths from the SAN Copy ports to the logical units on the remote system.
- Each SP on the SAN Copy system (SAN Copy port) has access to each SP on the remote system.

To accomplish this, we recommend that you create four zones from the SAN Copy system to the remote system. This results in a consistent easy-to-troubleshoot zoning configuration.

Zones	San Copy system	Remote system
Zone 1	SP A port 1	SP A port 1
Zone 2	SP A port 1	SP B port 1
Zone 3	SP B port 1	SP A port 1
Zone 4	SP B port 1	SP B port 1

If this zoning configuration does not meet your needs, you can also create your zoning based on the most important criteria for the SAN Copy session — performance, availability, or preserving host login resources. The following sections recommend zoning configurations for these criteria.

Note: As an absolute minimum, configure one zone that includes a single port on a single SP in the SAN Copy system and a single port on a single SP in the remote system. This configuration does not provide high availability for the SAN Copy session or access to logical units belonging to both SPs on the remote system.

Performance

If performance is most important, we recommend that you create multiple zones, each with a different SAN Copy port zoned to the same remote SP ports. SAN Copy allows multiple sessions to share a single port, but if multiple ports are available, SAN Copy will spread multiple sessions across available SAN Copy ports to maximize total throughput.

Note: This configuration increases performance only when you have multiple, concurrent copy sessions running. This configuration will not increase performance for a single session.

In Figure 15 on page 899, LUN 1 and LUN 2 on the SAN Copy system belong to SP A. Zones 1 and 3 provide multiple connection paths from LUNs 1 and 2 to the remote system. In this example, two SAN Copy sessions are running. One session is copying data from LUN 3 to LUN 1 using port 0 on SP A of the SAN Copy system. The other session is copying data from LUN 2 to LUN 4 and is using port 1 on SP A.

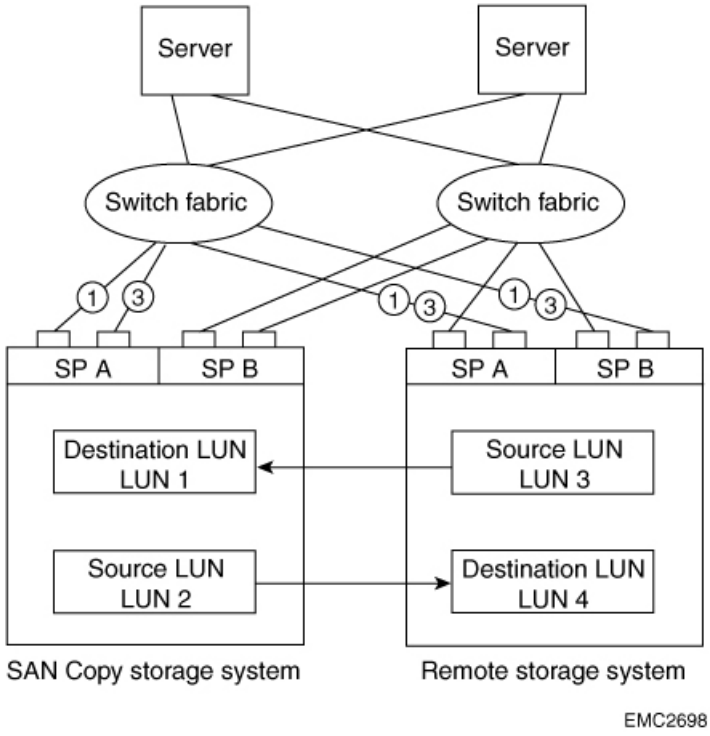


Figure 15. Recommended zoning based on performance

Availability

For high availability when you use SAN Copy, we recommend that you configure a minimum of two zones. Each zone should include one port from a different SP in the SAN Copy system and one port from each SP in the remote system.

Figure 16 on page 900 shows the minimum recommended high-availability SAN Copy zoning configuration using zones 1 and 2.

Zones	SAN Copy system	Remote system
Zone 1	SP A port 0	SP A port 1 and SP B port 1
Zone 2	SP B port 0	SP A port 0 and SP B port 0

In the following example, three copy sessions are running. The session copying data from LUN 2 to LUN 4 is using zone 1. The session copying data from LUN 3 to LUN 1 is using zone 2. The third session, LUN 2 to LUN 1, requires no zoning.

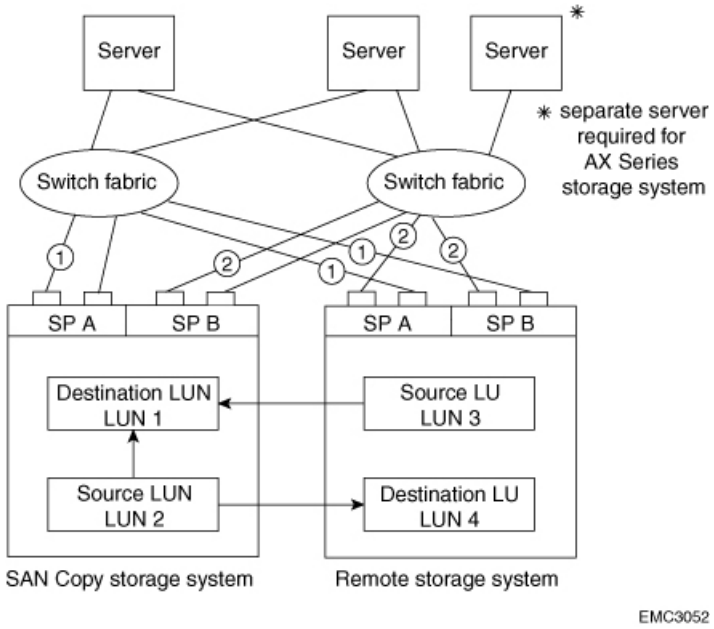


Figure 16. Recommended zoning based on availability

Limiting host login resources

If limiting host login resources is most important because a large number of hosts connect to a remote system, zone only necessary SAN Copy ports to that system.

The following table describes each zoning configuration:

Zones	SAN Copy system	Remote system
Zone 1	SP A port 0	SP A port 1 and SP B port 1
Zone 2	SP B port 0	SP A port 0 and SP B port 0

In Figure 17 on page 901, three copy sessions are running. The session copying data from LUN 2 to LUN 4 is using zone 1. The session copying data from LUN 3 to LUN 1 is using zone 2. The third session, LUN 2 to LUN 1 requires no zoning.

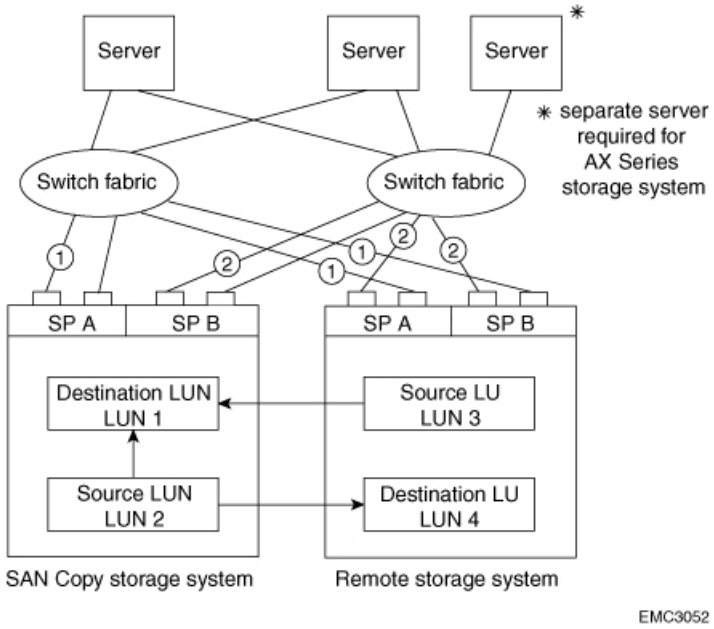


Figure 17. Recommended zoning based on limiting login resources

Single-initiator zoning examples without and with SAN Copy installed

A single-initiator zone includes only one host or SAN Copy initiator.

The two exceptions to the single-initiator rule for SAN Copy are:

- Never place more than one SAN Copy port in the same zone unless two SAN Copy systems are in the domain, and each system is acting as both the SAN Copy system and the remote system to the other.
- Never place a SAN Copy port in the same zone as the host unless the host HBA initiator is connected to the SAN Copy port for the purpose of host I/O.

Figure 18 on page 902 shows an example of single-initiator zoning between a server and two systems for the purpose of data I/O. Neither system is a SAN Copy system. In this example, zone 1 includes the HBA initiator port and a target port on each SP in both systems.

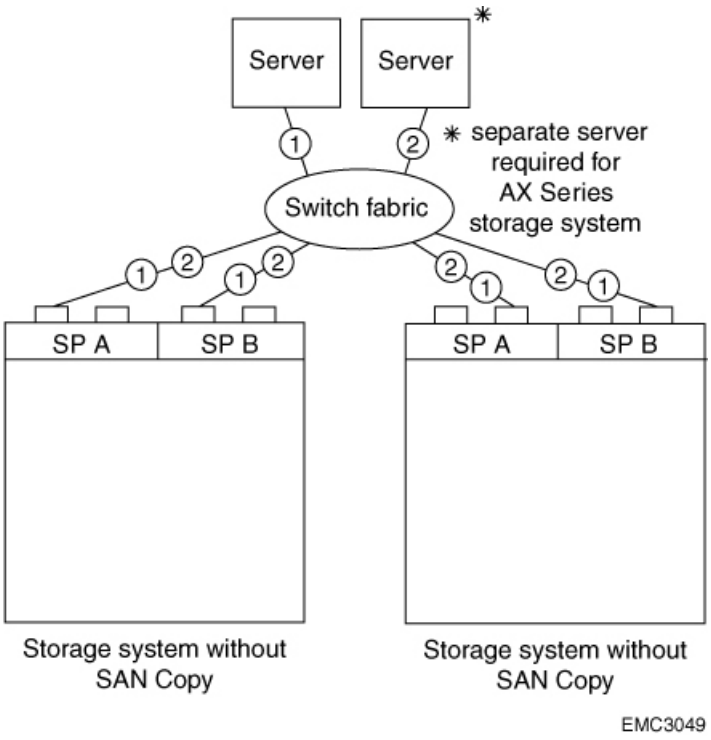


Figure 18. Sample single-initiator zoning without SAN Copy

If you install SAN Copy on one of the systems in the previous example, change your zoning to the configuration shown in Figure 19 on page 903. This example shows each SAN Copy port in a separate zone with the host initiator (zones 2 and 3). If you keep the zoning as it was in Figure 18 on page 902, additional login resources will be consumed for the ports, even if you are not currently using SAN Copy.

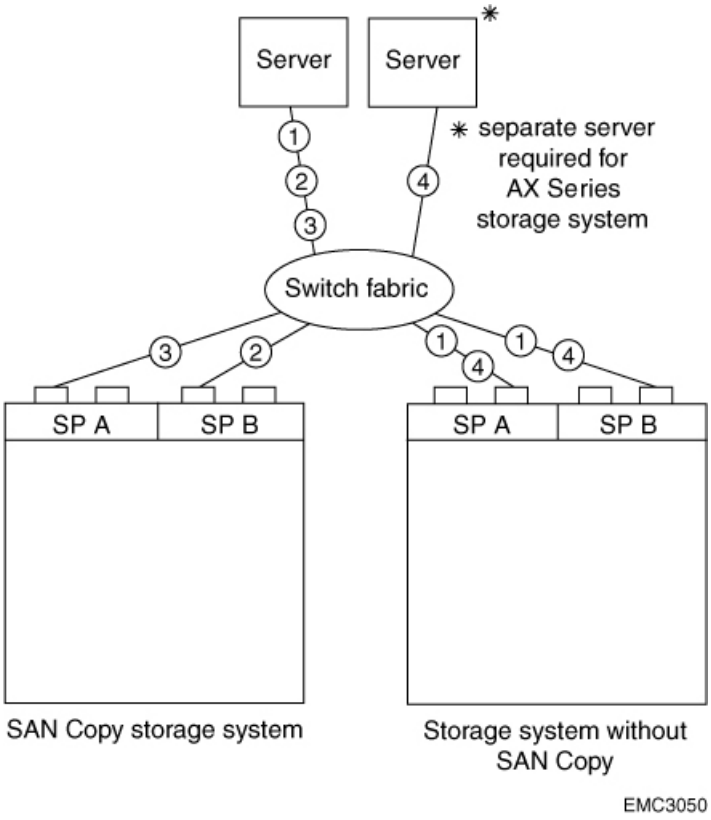


Figure 19. Sample single-initiator zoning with SAN Copy installed

Figure 20 on page 904 shows an example of single-initiator zoning between a server and two systems for the purpose of data I/O and SAN Copy data transfer. One of the systems is a SAN Copy system. In this example, the hosts are in zones with all necessary target ports, including SAN Copy ports (zones 1,2, 3 and 6), and the SAN Copy ports are in separate zones with the remote ports they must access (zones 4 and 5). The six zones are configured as follows:

Zone identifier	Purpose	Includes
Zone 1	Data I/O	HBA initiator port, SP A port 1 and SP B port 1 on remote system #1.
Zone 2	Data I/O	HBA initiator port, SP B port 0 on SAN Copy system.
Zone 3	Data I/O	HBA initiator port, SP A port 0 on SAN Copy system.
Zone 4	SAN Copy session	SP B port 0 on SAN Copy system, SP B port 1 on remote system.

Zone identifier	Purpose	Includes
Zone 5	SAN Copy session	SP A port 0 on SAN Copy system, SP A port 1 on remote system.
Zone 6	Data I/O	HBA initiator port, SP A port 1 and SP B port 1 on remote system #2

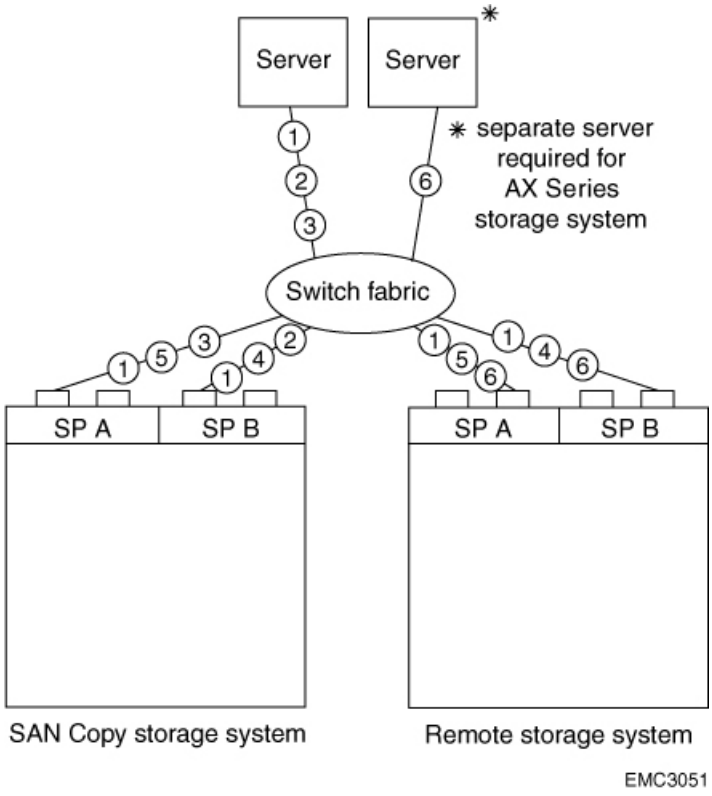


Figure 20. Sample single-initiator zoning with SAN Copy installed and configured

Preparing a Block system for a copy session

If you will be copying data between Block systems or between BLock and Symmetrix systems, follow the SAN Copy configuration requirements in SAN Copy configuration requirements on page 893, and prepare the Block systems as described in the following procedure. You can use logical units (LUNs) in a Block system as the source or destination of SAN Copy sessions.

If you will be copying data between LUNs within a Block system, see Copying data between LUNs within a Block system on page 895.

Note: For all sessions, you must install SAN Copy software on at least one of the Block systems. For incremental copy sessions, the source logical unit must reside in the SAN Copy system.

1. For Fibre Channel replication, use the native switch management tools to zone at least one port from an SP on the SAN Copy system to one or more SP ports on the participating remote systems (see Fibre Channel zoning requirements and recommendations on page 897).

   For iSCSI replication, create connection sets. A connection set establishes a replication session between an iSCSI initiator and an iSCSI target. A connection set consists of a unique user-defined name, optional username and password (secret), method for assigning security credentials (connection specific, array-shared or none), and one or more connection paths. Each connection set should include only one iSCSI initiator.

   Note: SAN Copy ports act as host initiators to remote systems (system without SAN Copy software).

2. Register the SAN Copy ports with any other SP ports in the same zone using the naviseccli or **navicli -h** *spname* **sancopy -updateconnections** command (see sancopy -updateconnections on page 969).

   If the remote system is a Block system, the SAN Copy ports are registered with each system, and the software adds a record for each SAN Copy port to the system's host initiator table. Unisphere displays an entry for each registered SAN Copy port in the Connectivity Status dialog box, and the SAN Copy Summary dialog box.

3. Verify that the SAN Copy ports are connected and registered with any systems that will participate in a copy session using the following command for each SP on the SAN Copy system:

   naviseccli -h *spname* **-port -list**

   where *spname* is the name of an SP in the SAN Copy system.

   Note: To use this command with **navicli**, replace **naviseccli** with **navicli.**

4. Connect the SAN Copy ports to Block groups (see the next section, Connecting SAN Copy ports to storage groups on page 906).

Connecting SAN Copy ports to storage groups

Note: Each SAN Copy port acts like a host initiator and, therefore, can connect to only one storage group at a time in a system.

In order for the LUNs to be accessible to the SAN Copy ports, you must connect the SAN Copy ports to the storage groups in which the LUNs reside. When connecting to the storage group, SAN Copy lets you select all available SP ports with valid connections to the storage group, or it lets you select specific ports.

If all participating logical units of a remote system already belong to the same storage group, you can connect SAN Copy ports to the existing storage group. However, if the logical units belong to different storage groups, we recommend that you create one or more new storage groups, place the logical units in these storage groups, and then connect SAN Copy ports to them. This is the only time we recommend placing the same logical unit in more than one storage group.

Note: Some operating systems do not support the same host accessing identical LUNs. Therefore, once SAN Copy completes the copy session, we recommend that you move any LUN copies to different storage groups.

For more information on the following CLI commands, refer to the *EMC Command Line Interface (CLI) Reference*.To use the **navicli** CLI command, replace **naviseccli** with **navicli.**

1. Use the following command to create storage groups:

   naviseccli -h *spname* **storagegroup -create -gname storagegroupname**

2. Use the following command to add LUNs to storage groups:

   naviseccli -h *spname* **storagegroup -addhlu -gname storagegroupname -hlu** *hlunnumber* **-alu** *alunnumber*

3. Use the following command (with information from the previous **naviseccli -port -list** command) to add the SAN Copy ports to storage groups:

   naviseccli -h *spname* **storagegroup -setpath -gname storagegroupname -hbauid** *hbawwn* **-sp a or b -spport** *portnumber*

spname is the	IP address of the SP on the system to which the storage group belongs

storagegroupname is the	name of the storage group to which you want to connect
hbawwn is the	World wide name of the SAN Copy port (from the -portlist command)
a or b is the	SP that owns the storage group
portnumber is the	the ID of the SP port hat owns the storage group (from the -portlist command)

If the sharing state of the storage group is Dedicated (only a single host can access the LUNs in the storage group), you must also specify one of the following switches: **-host** *hostname*, or **-ip** *ipaddress* where:

hostname is the	name of the host that has access to the LUNs in the storage group
ipaddress is the	IP address of the host that has access to the LUNs in the storage group

Figure 21 on page 908 shows a sample storage group configuration for SAN Copy. The remote system includes three storage groups labeled SG 1, SG 2 and SG 3. SG 1 and SG 2 provide I/O access to the LUNs from the attached hosts. SG 3 is a SAN Copy storage group.

In this example, we start with two SAN Copy sessions running concurrently. The LUNs in storage group 1 (LUN 1 and LUN 2) are participating in both sessions. Source LUN 1 on the SAN Copy system is copying data to LUN 1 in SG 1, and LUN 2 in SG 1 is copying data to the destination LUN on the SAN Copy system. Since both LUN 1 and LUN 2 belong to the same storage group, you can connect the same SAN Copy port directly to this storage group and both sessions can use this SAN Copy port.

In the future, you may want to start a third session that copies data from source LUN 2 to LUN 3 using the same SAN Copy port. Since LUN 3 is in a different storage group, we recommend that you create a new storage group (SG 3) for the SAN Copy sessions, and place LUN 1, LUN 2 and LUN 3 in this storage group. This is the only time we recommend placing the same logical unit in more than one storage group.

Note: Some operating systems do not support the same host accessing identical LUNs. Therefore, once SAN Copy completes the copy session, we recommend that you move any LUN copies to different storage groups.

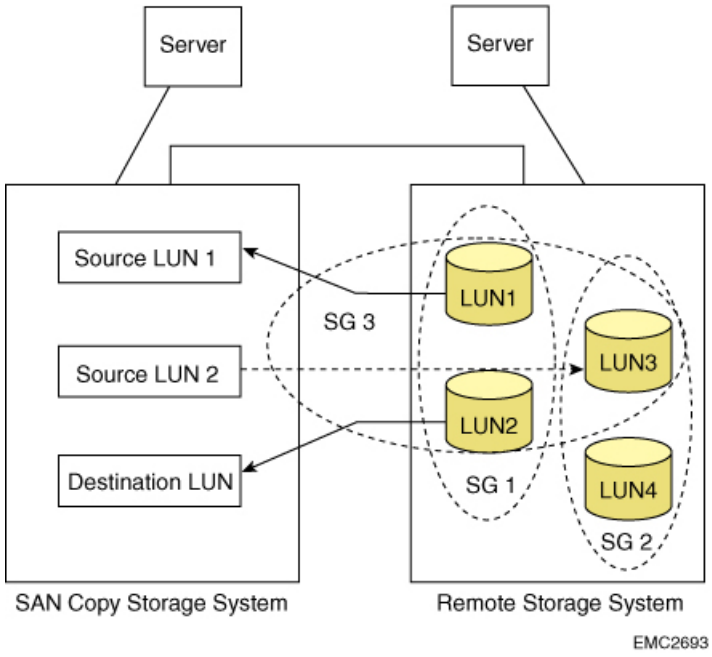


Figure 21. Sample SAN Copy storage group configuration

Preparing a Symmetrix system for a copy session

You can use logical units (volumes) in Symmetrix systems as the source or destination of a full SAN Copy session. For incremental sessions, the source logical units must reside in a SAN Copy system. In order to prepare a Symmetrix system for SAN Copy sessions, you must follow the SAN Copy configuration requirements and restrictions in SAN Copy configuration requirements on page 893, and use one of the following procedures.

Preparing a Symmetrix system using EMC ControlCenter SAN Manager

Note: To complete this procedure, you must be familiar with Unisphere, EMC ControlCenter® SAN Manager, and Solutions Enabler Device Manager CLI.

1. Use EMC ControlCenter SAN Manager 5.2 or higher to zone at least one port from an SP on the SAN Copy system to one or more FA ports on the participating Symmetrix systems (see Fibre Channel zoning requirements and recommendations on page 897).

   Note: You can also use the native switch management tools to zone a SP to one or more Symmetrix FA ports.

2. Verify that the host:
   - Has access to the Symmetrix volumes that are participating in the SAN Copy session
   - Is running the Unisphere Host Agent
   - Is connected to a system in the domain
   - Is part of a portal configuration within the domain. For information about portals, refer to the Unisphere online help.

3. Use Unisphere to register the SAN Copy ports with Symmetrix systems:
   a. In the Storage tree of the Enterprise Storage window, right-click the icon for the SAN Copy system.
   b. Select **SAN Copy** > **Update Connections**.

      The SAN Copy ports log in to the Symmetrix storage ports.

4. To verify that the SAN Copy ports have been registered with the Symmetrix system, use the Solutions Enabler CLI command:

symmask -sid *symmID* **list logins**

where *symmID* is the Symmetrix serial ID.

Note: Use the SymmCLI command **sympd list -sid** to determine the pathname for the VCM database, or run inq on the host, if available.

5. Use the following Solutions Enabler **symmask** command to assign Symmetrix volumes to the SAN Copy ports:

```
symmask -sid symmID -wwn SPportWWN add devs SymDevname|SymDevname -dir
<#> -p <#>
```

For example:

```
symmask -sid 0128 -wwn 11:22:33:44:55:66:77:88 add devs 0014,0015 -dir
16a -p 0
```

Preparing a Symmetrix system using ESN Manager

Note: To complete this procedure, you must be familiar with both Unisphere and ESN Manager.

1. Use the native switch management tools to zone at least one port from an SP on the SAN Copy system to one or more FA ports on the participating Symmetrix systems (see Fibre Channel zoning requirements and recommendations on page 897).

Note: SAN Copy ports act as host initiators to remote systems (system without SAN Copy software).

2. Use ESN Manager version 2.1 to place the SAN Copy ports on the host side of the topology view.
   - If this is a new installation of the system, complete steps a through d in the following procedure.
   - If ESN Manager has already discovered the system and it is visible on the storage side of the topology view, complete steps b through d.

Note: ESN Manager will not allow the SAN Copy ports (SP ports being used as initiators) to access the Symmetrix volumes unless the ports are visible on the host side of the topology view.

   a. Configure ESN Manager to discover the system.

Once ESN Manager discovers the system, it places an icon for it on the storage side of the topology view.

b. Use ESN Manager to move the system to the host side of the topology view.

i. In the Tools menu, select **Options** > **Out Band**.

ii. In the **Out-Band** dialog box, select the system and clear the **Enable** checkbox.

Icons for the SAN Copy ports are displayed as hosts in the topology view.

3. Verify that the host with access to the Symmetrix volumes that are participating in the SAN Copy session is running the Unisphere Host Agent, and is either:

- Connected to a system in the domain

or

- Part of a portal configuration within the domain. For information about portals, see the online help or the *EMC Command Line Interface (CLI) Reference.*

4. Register the SAN Copy ports with any other SP ports in the same zone using the **`navicli -h`** *`spname`* **`sancopy -updateconnections`** command (see sancopy -updateconnections on page 969).

The SAN Copy ports log in to the Symmetrix storage ports.

5. To verify that the SAN Copy ports have been registered with the Symmetrix system, use the Symmetrix CLI command:

`fpath` *`lshist`* **`-d`** *`physicaldrive`*

where *`physicaldrive`* is the location of the VCM database on this host.

Note: Use the SymmCLI command **`fpath lshostdev`** to determine the pathname for the VCM database, or run inq on the host, if available.

---

6. Use ESN Manager to assign Symmetrix volumes to the SAN Copy ports.

Note: This is the same as assigning volumes to the host initiator.

---

7. Use ESN Manager to move the system back to the storage side of the topology view.

8. To verify that the SAN Copy port has access to the Symmetrix remote volumes, click the SAN Copy port entry and, in the volumes panel, make sure that ESN Manager surrounds any volumes that are accessible to the SP port with solid blue squares.

If you are copying data to a third-party system, use the third-party system management documentation to:

- Verify that the SAN Copy initiator has logged in to the system
- Provide access to the volume on the third-party system to the SAN Copy initiator

About admhost for SAN Copy

The admhost utility is an executable program that you can run interactively with a script. The admhost commands can activate and deactivate the source and destination logical units being used in a SAN Copy session, and can flush data from operating system buffers to ensure that the information on the source logical unit is current.

Note: Currently, admhost is supported only on the following Microsoft Windows platforms: Windows Server 2003, and Windows 2000. For the supported versions of these operating systems, see the SAN Copy Release Notes, or the EMC admhost Release Notes.

---

admhost SAN Copy command functions

This section lists the admhost commands and describes their function in SAN Copy sessions.

Note: The admhost utility is not supported on a UNIX host. Use the commands your operating system normally uses to discover new logical units, flush buffers, and unmount the logical units.

Table 22. admhost functions and descriptions

Function	Description	Syntax and examples
admhost lun_activate	The admhost lun_activate command scans the bus for new devices and assigns a drive letter to all Symmetrix® and Block devices that do not already have one. Use the -l and -d switches to scan the bus for new devices and assign a drive letter to a device that has a specific World Wide Name (WWN). This command does not assign drive letters to any other devices. If admhost_activate is used and no new devices are found, and drive letters are already assigned to the Block and Symmetrix logical units, admhost reports an error message.	admhost lun_activate [-l lun_wwn -d drive_letter][-h] where -l lun_wwn specifies the World Wide Name (WWN) of the LUN to which you want to assign a drive letter (requires the -d switch). -d drive_letter specifies the drive letter you want to assign to the specified LUN (requires the -l switch). -h displays the help message. If the admhost lun_activate command activates more than one device, the drive letter is assigned to the first device in the list.
admhost lun_deactivate	The admhost lun_deactivate command attempts to take devices offline and make them inaccessible to the operating system. The command deletes the drive letter and dismounts the device. Use the admhost lun_activate command to bring the volume back online. Use this command on the source or destination host prior to starting a SAN Copy session (see Preparing logical units for a SAN Copy session on page 917).	admhost lun_deactivate -o object_name [-t object_type][-h] where -o object_name specifies the drive letter of the device you want to deactivate. When you specify the object name, admhost finds the device, deletes its drive letter, dismounts it, and then takes the device offline. -t object_type is an optional switch that specifies the object type (device or drive letter) of the device you want to deactivate. -h displays the help message.

Table 22. admhost functions and descriptions *(continued)*

Function	Description	Syntax and examples
admhost lun_flush	On a Windows host, the command flushes all data for the specified object_type so that the data in the write cache is written to disk. Use this command on the source or destination host prior to starting a SAN Copy session (see Preparing logical units for a SAN Copy session on page 917).	admhost lun_flush [-h] -o object_name [-t object_type device|driveletter] where -h displays a help message. -o object_name specifies the name or drive letter of the device you want to flush. -t object_type is an optional switch that specifies the object type (device or drive letter) of the device you want to flush. If you specify the device name, admhost identifies the corresponding device and drive letter.
admhost lun_list	Use to perform a list operation. This command lists the drive letters and WWNs for all host devices.	admhost lun_list [-h] [-l lun_wwn] [-d object_name] [-a output_style] where -h displays a help message. -l lun_wwn specifies the WWN of the device you want to list. -d object_name specifies the drive letter or name of the device you want to list. -a output_style specifies an alternative output style for the list output. The default style lists the drive letter and WWN for the logical unit. The -a switch lets you specify physical drive as the output style.

Table 22. admhost functions and descriptions *(continued)*

Function	Description	Syntax and examples

admhost help	This command displays the syntax for each admhost command and the revision number of the admhost utility.
	
	Output for the admhost help command is shown below.
	
	`Revision number: V1.1.0.0.0 - 0`
	
	`Valid operations include: lun_flush, lun_activate, lun_deactivate, lun_list, and help.`
	
	`Valid types include: device and driveletter.`
		admhost help

Preparing logical units for a SAN Copy session

Before you start a full SAN Copy session, and before you mark an incremental copy session, you must prepare the source and destination logical units that will be participating in the session. For a SAN Copy session with logical units connected to a Windows server, use the admhost utility. For all other types of servers, use the command specific to the server's operating system.

Use the following procedures to prepare source and destination logical units for full and incremental sessions.

Preparing source and destination logical units for full and incremental sessions

CAUTION You must follow this procedure explicitly to avoid data loss or data corruption.

1. Stop all I/O to the source and destination logical units.

   Note: For incremental copy sessions, we strongly recommend that you stop all I/O to the source logical unit, and flush any server buffers prior to starting/marking the session. Once you receive confirmation that the mark or start session operation was successful, you can resume I/O to the source LUN.

   If you do not stop all I/O and flush the server buffers to the source logical unit, the resultant data copy will be "crash consistent." This means that the contents of the copy will be similar to the contents left on a logical unit if the server crashes. You may be required to use the fsck or similar utility to make the data copy mountable. In this situation, the data copy may not contain the unflushed server data.

2. From the servers connected to any destination logical units, flush the host buffers and disconnect the logical units from the server by doing one of the following:

   Note: If the destination logical units are not mounted, ignore this step.

   - On a Windows Server 2003, or Windows 2000 host, use the following command to flush the host buffers and write the data to disk:

     admhost lun_flush **-o destination drive letter**

     For example, to flush the host buffers on drive F:, enter the following command:

     ```
     admhost lun_flush -o F:
     ```

- On a Windows Server 2003 or Windows 2000 host, use the following command to take the disk offline:

  admhost lun_deactivate **-o destination -drive letter**

  For example, to take drive F: offline, enter the following command:

  ```
  admhost lun_deactivate -o F:
  ```

- On a UNIX server, use the **unmount** command to unmount the file system on any destination logical units.
- On a NetWare server, use the **dismount** command to dismount the file system on any destination logical units.

3. From the server connected to the *source logical units*, deactivate source logical unit, flush the server buffers and disconnect the source logical units from the server by doing one of the following:

Note: If you want to maintain read access to the source logical unit, skip this step.

- On a Windows Server 2003 or Windows 2000 host, use the following command to flush the host buffers and write the data to disk:

  admhost lun_flush **-o source -drive letter**

  For example, to flush the host buffers on drive F:, enter the following command:

  ```
  admhost lun_flush -o F:
  ```

- On a Windows Server 2003, or Windows 2000 host, use the following command to take the disk offline:

  admhost lun_deactivate **-o source -drive letter**

  For example, to take drive F: offline, enter the following command:

  ```
  admhost lun_deactivate -o F:
  ```

- On a UNIX server, use the **umount** command to unmount the file system on any source logical units.
- On a NetWare server, use the **dismount** command to dismount the file system on any source logical units.

SAN Copy CLI commands

This section explains the **sancopy** commands used with **naviseccli** or **navicli** CLI commands to manage the SAN Copy software. These commands function only with a system that has the optional SAN Copy software installed.

SAN Copy command functions

The EMC Navisphere CLI provides one of the two interfaces to the SAN Copy software. The Unisphere UI provides the other. The CLI command is **naviseccli sancopy** or **navicli sancopy** and you specify functions with switches.

The sancopy command functions, listed alphabetically, are:

- sancopy -create
- sancopy -destinfo
- sancopy -duplicate
- sancopy -info
- sancopy -mark
- sancopy -modify
- sancopy -pause
- sancopy -remove
- sancopy -resume
- sancopy -settings
- sancopy -start
- sancopy -stop
- sancopy -throttle
- sancopy -transfer
- sancopy -unmark
- sancopy -updateconnections
- sancopy -verify

The sancopy functions are listed functionally, in the order you would perform them, in the following table.

Table 23. naviseccli or navicli sancopy command functions, listed in order of use

Command	Description
Essential functions (in order performed)	
sancopy -create, or sancopy -create -incremental	Creates a full SAN Copy session Creates an incremental SAN Copy session
sancopy -mark (incremental copy sessions only)	Creates a point-in-time copy of the changes that have taken place since the last copy session up to the time the session is marked
sancopy -start	Starts a SAN Copy session based on copy descriptor information
Optional status functions (alphabetically)	
sancopy -destinfo	Displays information on a particular session from the destination point of view
sancopy -info	Displays information on all SAN Copy sessions or displays attributes for a particular session
sancopy -stop	Stops a SAN Copy session
sancopy -verify	Ensures that the SAN Copy software can access a logical unit
Optional reconfiguration functions (alphabetically)	
sancopy -duplicate (full copy sessions only)	Creates a duplicate copy descriptor
sancopy -modify	Changes parameters in a copy descriptor
sancopy -pause	Pauses a SAN Copy session
sancopy -remove	Deletes a copy descriptor
sancopy -resume	Continues a paused, stopped or failed session

sancopy -throttle	Changes the throttle (execution rate) of an existing, running session
sancopy -unmark (incremental copy sessions only)	Removes the existing mark in preparation for inserting a new mark
sancopy -transfer	Transfers control of a copy descriptor to the peer SP
sancopy -settings	Gets or sets environmental control parameters
sancopy -updateconnections	Updates system registration information

sancopy -create

Creates full and incremental SAN Copy sessions

PREREQUISITES

For **naviseccli**, you must have a user account on the system on which you want to execute the command.

For **navicli**, you must have a username/host entry in the Unisphere SP agent configuration file to use this command.

DESCRIPTION

Note: In addition to all the **sancopy -create** command switches, the **sancopy -create -incremental** command uses the following optional switches: **-changesonly**, **-linkbw**, and **-latency** (See Incremental SAN Copy sessions on page 888).

The **naviseccli** or **navicli sancopy** command with the **-create** switch creates a full SAN Copy session. A full session copies all the data on the source LUN to the destination logical units. When used with the optional **-incremental** switch, the **-create** command creates an incremental SAN Copy session. An incremental session copies only the data that has changed since the last copy session. This command supports thin LUNs as either sources or targets in the systems, if the system executing the CLI command (or the target system) is running a committed bundle that supports San Copy with thin LUNs.

Note: The destination logical unit(s) must exist when you execute this command.

By default a descriptor does not start a session unless you specify the **-start** switch.

For information on logical units accessible to the host use the basic CLI command **lunmapinfo** explained in the CLI reference manual.

SYNTAX

sancopy -create [**-incremental**] **-name** *sessionName*

-srcwwn *source-lun-wwn* | **-srclun** *source* **-sp** *sourcelunnumber* [**-device** *devicename*]

-srcportwwn *destportwwn destlunnumber*

-destwwn *dest-lun-wwn* | **-destlunnumber** *dest* **-sp** *destlunnumber*| **-destportwwn** *destportwwn destlunnumber* [**-start**]
[**-throttle** n]
[**-verify**]
[**-o**]

OPTIONS

-name *sessionName*

Specifies the SAN Copy session name. The name can be up to 64 characters and must be unique on a per-system basis. The names you create persist until you remove them.

For incremental SAN Copy sessions, SAN Copy creates a corresponding reserved session. The name assigned to the reserved session consists of the SAN Copy session name prefixed with the text "SANCopy_". This text is included in the 64-character limit. For example, if a SAN Copy session has the name june_update, the name of the corresponding reserved session is SANCopy_june_update.

-srcwwn *source-lun-wwn*

Note: For incremental sessions, the source LUN cannot be a SnapView snapshot, and it cannot be on a remote system. For incremental sessions, the source LUN must reside in the SAN Copy system.

Specifies the World Wide Name (WWN) of the source logical unit (LUN or snapshot) that will participate in the session. For full copy sessions, the source logical unit can reside in either the SAN Copy system or the remote system. If the source logical unit does not reside in the system specified by the **-h** switch, all destination logical units must reside in the system specified with **-h**.

By default, the connection type for the specified source logical unit will be set to **fibrepreferred**. This sets the connection type to fibre or iSCSI (if fibre path could not be found) each time you start or resume a session. You can change the connection type using one of the following switches: **-fibre** or **-iscsi**.

Note: If the source logical unit does not reside in a remote system, setting the connection type will be ineffective.

-fibre

Sets the source logical unit's connection type to fibre.

-iscsi

Sets the source logical unit's connection type to iSCSI.

-srclun *source-sp sourcelunnumber*

An alternate way of adding a source logical unit entry to the copy descriptor. For *source-sp*, specify the SP hostname (or SP IP address) that owns the source logical unit. For *sourcelunnumber*, specify the logical unit number.

Note: For pre-FC4700 systems, if you use the **-srclun** *source-sp sourcelunnumber* function, you must use **-device** *devicename*.

By default, the connection type for the specified source logical unit will be set to **fibrepreferred**. This sets the connection type to fibre or iSCSI (if fibre path could not be found) each time you start or resume a session. You can change the connection type using one of the following switches: **-fibre** or **-iscsi**.

Note: If the source logical unit does not reside in a remote system, setting the connection type will be ineffective.

-fibre

Sets the source logical unit's connection type to fibre.

-iscsi

Sets the source logical unit's connection type to iSCSI.

-device *devicename*

Note: This command is required for pre-FC4700 systems.

Specifies the device name of the source LUN or destination LUN.

-srcportwwn *destportwwn destlunnumber*

Valid only for specifying source LUNs that reside in supported non-EMC systems. For *srcportwwn*, specify the World Wide Name of the SP port on the source system that owns the source LUN; for *srclunnumber* specify the number of the source LUN.

-destwwn *dest-lun-wwn*

Specifies which logical unit will be the destination of the copy. You can specify more than one destination logical unit if you want more than one copy of the source logical unit. If the destination logical units are not reachable by the client system, and you did not use the **-o** function, the CLI will display a warning and ask for confirmation.

By default, the connection type for the specified destination logical unit will be set to **fibrepreferred**. This sets the connection type to fibre or iSCSI (if a fibre path could not be found) each time you start or resume a session. You can change the connection type with one of the following switches: **-fibre** or **-iscsi**.

Note: If the destination logical unit does not reside in a remote system, setting the connection type will be ineffective.

-fibre

Sets the destination logical unit's connection type to fibre.

-iscsi

Sets the destination logical unit's connection type to iSCSI.

-destlunnumber *dest-sp destlunnumber*

An alternate way of adding a destination LUN entry to the copy descriptor. For *dest-sp*, specify the SP hostname (or SP IP address) that owns the destination logical unit; for *destlunnumber*, specify the LUN number. As with **-destwwn**, you can specify more than one destination logical unit if you want more than one copy of the source logical unit.

If you specify the **-verify** function, and the software cannot reach the SP or find the logical unit on the SP, it returns an error.

By default, the connection type for the specified destination logical unit will be set to **fibrepreferred**. This sets the connection type to fibre or iSCSI (if a fibre path could not be found) each time you start or resume a session. You can change the connection type with one of the following switches: **-fibre** or **-iscsi**.

Note: If the destination logical unit does not reside in a remote system, setting the connection type will be ineffective.

-fibre

Sets the destination logical unit's connection type to fibre.

-iscsi

Sets the destination logical unit's connection type to iSCSI.

-destportwwn *destportwwn destlunnumber*

Valid only for specifying destination LUNs that reside in supported non-EMC systems. For *destportwwn*, specify the World Wide Name of the SP port on the destination system that owns the destination LUN; for *destlunnumber* specify the number of the destination LUN.

-start

Starts a SAN Copy session using this copy descriptor. By default, the **-create** command does not start a session.

-throttle n

Specifies the I/O rate of the copy. The maximum value is 10 and the minimum value is 1. If you omit this switch, the default value is 6.

-verify

Verifies that SAN Copy can access all of the logical units specified in the **-create** command.

-o

Suppresses a message asking you to confirm that you want to create a session now.

-incremental

The following optional switches are used only with the **sancopy -create -incremental** command:

-changesonly

If the source LUN and destination LUNs are synchronized when you create the session, use this switch. When you start the session, SAN Copy will copy only the changes that have occurred to the source LUN since the initial synchronization, and any subsequent sessions will copy only the changes.

If the source LUN and destination LUNs are not synchronized (or you are unsure of the copy state), do not use this switch. The first time you run the session, SAN Copy will copy the entire source LUN to the destination LUNs. Any subsequent sessions will copy only the changes.

-linkbw

Specifies the available link bandwidth for the copy session. You can use the entire bandwidth of your network connection for incremental SAN Copy sessions, or you can specify only a portion of it.

For CX3 series systems, the minimum allowable value is .016 Mb/s and the maximum value is 4096. For all other CX series systems, the minimum allowable value is .016 Mb/s and the maximum value is 2048. The default value is .15 mbps/ (equivalent to a T1 line).

-latency

The amount of time it takes to transmit a block of data to its destination expressed in milliseconds. Valid values are auto (SAN Copy computes the latency value), or a decimal number with no maximum limit. The default value is auto.

Note: If you create and start incremental sessions, and the copy is performed over a link that is slower than Fibre Channel, SAN Copy uses the link bandwidth and latency values to calculate the optimum buffer space for the session.

EXAMPLE

Full session example: For SP **ss1_spa**, the **-create** command creates a full copy session named copy_lun66 that defines source logical unit 66 on this SP and destination logical unit

22 on host SP ss5_spa. The **-start** command then starts the copy session and the **-throttle** command specifies a throttle value of 3 for this session.

```
Incremental session example: The command below creates an incremental copy
 session named copy_77
that defines logical unit 1 on SP 10.22.33.44 as the source and logical
unit 22 on SP ss5_spa as the
destination. The -linkbw command specifies a bandwidth value of 100
Mbits/sec.,
and the latency value defaults to auto.

naviseccli -h ss1_spa sancopy -create -name copy_lun66 -srclun
  ss1_spa 66 -destlunnumber ss5_spa 22 - start -throttle 3

naviseccli -h 10.22.33.44 sancopy -create -incremental -name
  copy_77 -srclun 10.22.33.44 1 -destlunnumber ss5_spa 22 -linkbw 100
```

OUTPUT

If the version of FLARE software running on the SP does not support this command, a `command is not supported` error message is printed to **stderr**. Other errors are:

```
DMF_NAME_SPECIFIED_NOT_UNIQUE

DMF_CREATE_PARAMS

DMF_SRCLUN_WWN_AND_NUMBER_SPECIFIED

DMF_DESTLUN_WWN_AND_NUMBER_SPECIFIED

DMF_INVALID_THROTTLE_VALUE
```

sancopy -destinfo

Displays information about destination logical units for a running session

PREREQUISITES

For **naviseccli**, you must have a user account on the system on which you want to execute the command.

For **navicli**, you must have a username/host entry in the Unisphere SP agent configuration file to use this command.

DESCRIPTION

Note: In addition to all the **sancopy -destinfo** command switches listed above, incremental copy sessions use the optional **-syncstate** switch.

The **naviseccli** or **navicli sancopy** command with **-destinfo** gets session status from the destination point of view.

Note:

If you have only full copy sessions, issuing the **-destinfo** command with no arguments displays all destination information for all copy sessions belonging to the specified SP.

If you have both full and incremental copy sessions, and you issue the **-destinfo** command with no arguments, some parameters for full sessions and all parameters specific to incremental sessions will not be displayed. In order to see all parameters for both full and incremental sessions, you must use the **-destinfo -all** command.

We recommend that you use the **-destinfo -all** command for both full and incremental sessions.

SYNTAX

```
sancopy-destinfo [-peer]
[-descriptorid descriptorid] | [-name name]
[-destwwn dest-lun-wwn] [-destlunnumber destsp destlunnumber]
[-destportwwn destportwwndestlunnumber]
[-complete]
[-counts]
[-failure]
[-time]
[-connectiontype]
[-all]
```

OPTIONS

-peer

Lists all destination information for the peer SP.

-descriptorid *descriptorid* | **-name** *name*

Used alone, **-descriptorid** or **-name** displays descriptor IDs or names of all copy descriptors of the specified SP; **-descriptorid** with an ID or **-name** with a name lists the status (WWN, failure status, transfer count, percent complete and failure time) of all destinations of the copy descriptor.

-destwwn *dest-lun-wwn*

Used alone, **-destwwn** displays the WWNs of all destinations of the descriptors. **-destwwn** with a WWN lists the status of the specified destination logical unit.

-destlunnumber *destsp destlunnumber*

The switch **-destlunnumber** cannot be used alone. When used with the SP name and LUN number, it displays the status of the specified destination logical unit.

-destportwwn *destportwwn lunnumber*

The switch **-destportwwn** displays the status of the specified destination LUN that resides in a supported non-EMC system.

-complete

Displays the percentage complete of the copy session when any destination logical unit(s) failed. Displays **N/A** when there is no failure.

-counts

Displays the number of disk blocks transferred when any destination logical units failed. Displays **N/A** when there is no failure.

-failure

Displays failure status or `No Failure` for destination logical unit(s). For more information, also use the **-time**, **-counts**, and/or **-complete** switches.

-time

Displays the time when any destination logical unit(s) failed. Displays **N/A** when there is no failure.

-connectiontype

Displays the requested and the actual connection type used for all destination logical units participating in the copy session.

Valid values for Requested Connection Type are fibre, iSCSI or fibre preferred. Valid values for Actual Connection Type are fibre, iSCSI, undetermined and N/A (for destination logical units within the same system).

-all

Displays all destination information for both full and incremental copy sessions belonging to the specified SP.

Note: If you have both full and incremental copy sessions, and you issue the -destinfo command with no arguments, some parameters for full sessions and all parameters specific to incremental sessions will not be displayed. In order to see all parameters for both full and incremental sessions, use the **destinfo -all** command.

The following optional switch is used only with incremental sessions:

-syncstate

Displays the state of the data of the specified destination logical unit with respect to the source logical unit. Valid states are N/A, Inconsistent, and Initial Copy Required.

EXAMPLE

This example displays the output for a full copy session using the **-destinfo** command without the **-all** switch. In order to display all the information for an incremental copy session, use the **-destinfo -all** command.

```
 naviseccli -h dm340c-16a sancopy -destinfo -connection type
Copy Descriptor Name: Std0_1

Copy Descriptor ID: 7202
Owner: SPA

Requested Connection Type: Fibre Preferred
Actual Connection Type: N/A

Requested Connection Type: Fibre Preferred
Actual Connection Type: N/A

In the example below, the session includes two destination logical units.
The requested connection type and the actual connection type are displayed
 for both destinations.

 naviseccli -h ss1_spa sancopy -destinfo

Copy Descriptor Name: DMHOST7_SAN005_10.6.92.169_00_p000
```

```
Copy Descriptor ID: 8

Owner: SPB

Copy Descriptor Type: Incremental

Copy Whole LUN: NO

Source LUN WWN: 60:06:01:60:0E:C2:1C:00:84:C4:31:B2:1C:24:DC:11

Source PortWWN and LUN: N/A

Number of Blocks to Copy: 0

Size of source LUN: 8388608

Number Of Destinations: 2

Destination LUN WWN:
  60:06:01:60:61:31:19:00:FD:C8:6D:54:1C:24:DC:11,
  60:06:01:60:61:31:19:00:6E:F0:C3:61:1C:24:DC:11

Destination PortWWN and LUN: N/A

Session Status: Complete

Initial Throttle: 4

Current Throttle: 4

Transfer Count: 8388608

Percent Complete: 100

Start Time: 06/27/07 10:51:05

Completion Time: 06/27/07 12:55:12

Duration: 2 hr 4 min 7 sec

Failure Status: No Failure

Marked: NO

Mark Time: N/A

Blocks modified since mark: N/A

Link Bandwidth (Mbps): 1.024

Effective Bandwidth (Mbps): 0.719

Latency (msec): Auto

Measured Latency (msec): 6.140

Requested Connection Type: Fibre Preferred
```

```
Actual Connection Type: N/A
```

OUTPUT

If the version of FLARE software running on the SP does not support this command, a `Command is not supported` error message is printed to **`stderr`**.

sancopy -duplicate

Makes a copy of a copy descriptor

PREREQUISITES

For naviseccli, you must have a user account on the system on which you want to execute the command.

For navicli, you must have a username/host entry in the Unisphere SP agent configuration file to use this command.

DESCRIPTION

The **naviseccli** or **navicli** sancopy command with **-duplicate** makes a copy of an existing copy descriptor. You can then modify the copy as needed (**-modify**). The copy descriptor that you want to duplicate can be part of an active SAN Copy session. You do not need to stop the copy descriptor before duplicating it.

Note: The **sancopy -duplicate** command is not supported for incremental SAN Copy sessions.

SYNTAX

sancopy -duplicate -descriptorid *descriptorid*|**-name** *name*

OPTIONS

-descriptorid *descriptorid* | **-name** *name*

Identifies the descriptor you want to duplicate.

EXAMPLE

This command duplicates SP **ss1_spa**'s copy descriptor copy_lun_66 and assigns a default name to the new descriptor - copy of xxx, where xxx is the name of the descriptor you are duplicating, for example, a copy of copy_lun_66.

```
naviseccli -h ss1_spa sancopy -duplicate -name copy_lun_66
```

Note: To use this command with **navicli**, replace **naviseccli** with **navicli**.

OUTPUT

If the version of FLARE running on the SP does not support this command, a `Command is not supported` error message is printed to **`stderr`**. Other errors are:

`DMF_NAME_AND_UID_SPECIFIED`

`DMF_NAME_OR_UID_REQUIRED`

`DMF_UNKNOWN_DESCRIPTOR`

sancopy -info

Displays information about copy descriptors

PREREQUISITES

For naviseccli, you must have a user account on the system on which you want to execute the command.

For navicli, you must have a username/host entry in the Unisphere SP agent configuration file to use this command.

DESCRIPTION

Note: In addition to all the **sancopy -info** command switches listed above, incremental copy sessions use the following optional switches: **-copywholelun**, **-markstatus**, **-srcsize**, **-link** (see Incremental SAN Copy sessions on page 888).

The **naviseccli** or **navicli** sancopy command with **-info** displays information on copy sessions. It differs from **-destinfo** in that **-destinfo** gets information on the destination logical units.

Note:

If you have only full copy sessions, issuing the **-info** command with no arguments displays all destination information for all copy sessions belonging to the specified SP.

If you have both full and incremental copy sessions, and you issue the **-info** command with no arguments, some parameters for full sessions and all parameters specific to incremental sessions will not be displayed. In order to see all parameters for both full and incremental sessions, use the **-info -all** command.

We recommend that you use the **-info -all** command for both full and incremental sessions.

SYNTAX

```
sancopy -info [-peer]
[-descriptorid descriptorid|-name name]
[-srcwwn]
[-length]
[-numdests]
[-dests]
[-sessionstatus]
[-throttle]
[-counts]
[-complete]
```

[**-time**]
[**-failure**]
[**-duration**]
[**-type**]
[**-connectiontype**]
[**-all**]

OPTIONS

-peer

Lists all destination information on the peer SP.

-descriptorid *descriptorid*

Lists the descriptor IDs of all sessions belonging to the specified SP when you issue this command without a specific descriptor ID.

Lists the status of the specified session when you issue this command with a specific descriptor ID.

-name *name*

Lists the names of all copy descriptors belonging to the specified SP when you issue this command without a specific copy descriptor name.

Lists the status of the specified copy descriptor when you issue this command with a name.

-srcwwn

Displays the WWNs of all source logical units.

-length

Displays the number of blocks to copy. Displays **N/A** if the descriptor was created using the source WWN.

-numdests

Displays the number of destination logical units.

-dests

Displays the WWNs of all destinations logical units in the specified descriptor.

-sessionstatus

Displays the status of the session associated with the copy descriptor: not started, complete, stop, pause, or failed.

-throttle

Displays the current throttle value for the copy session.

-counts

Displays the number of disk blocks transferred.

-complete

Displays the percentage complete of the copy session.

-time

Displays the time when the copy completes.

-failure

Displays failure status or `No Failure` for the copy descriptor's source and destination logical units.

-duration

Displays the completion time and duration of the session.

-type

Displays the session type - Full or Incremental.

-connectiontype

Displays the requested and the actual connection type used for the source logical unit participating in the copy session.

Valid values for Requested Connection Type are fibre, iSCSI or fibre preferred. Valid values for Actual Connection Type are fibre, iSCSI, undetermined and N/A (for source logical units within the same system).

-copywholelun

Displays whether the session will copy the entire source logical unit or only changes to it. If Yes, the session copies the entire logical unit; if No, it copies only the changes.

-markstatus

Note: If a session is marked, SAN Copy creates a point-in-time copy of the changes that have taken place since the last copy session up to the time the session is marked.

Displays whether the session has been marked, and if yes, displays the time of the mark, and the number of blocks of data that have changed since the mark occurred (these data blocks will not be copied when the session starts).

-srcsize

Displays the size, in blocks, of the source logical unit.

-link

Displays the status of any network link utilization performance parameters as follows:

Link Bandwidth — Link bandwidth of the network connection set when the session was created. Value is in Mb/sec.

Effective Bandwidth — Actual link bandwidth for the session measured by SAN Copy.

Latency — Displays the latency value set when the session was created or the default value of Auto. Latency is the amount of time it takes to transmit a block of data to its destination expressed in milliseconds.

Measured Latency — The actual measured latency of the session expressed in milliseconds.

-all

Displays all session information for both full and incremental copy sessions belonging to the specified SP.

Note:

You must use the **-destinfo -all** command to display information that is specific to incremental sessions. We recommend that you use the **-destinfo -all** command for both full and incremental sessions.

The information displayed with the **-all** command may change in future revisions of the software.

EXAMPLE

This command displays the status of all copy descriptors for both SPs, but does not include any information specific to incremental copy sessions. The format is as follows:

```
naviseccli sancopy -info -all
```

Copy Descriptor name	session1
Copy Descriptor ID:	4
Owner	SP A
Copy Descriptor Type	Full
Source LUN WWN:	60:06:01:60:72:70:18:00:5A:FE:9A:58:0E:5A:DB:11
Source PortWWN and LUN	N/A
Number of Blocks to Copy:	4194304
Number Of Destinations:	1

Destination LUN WWN:	60:06:01:60:72:70:18:00:5B:FE:9A:58:0E:5A:DB:11
Destination PortWWN and LUN	N/A
Session Status:	A session was active when the Storage Processor (SP) re-booted. The session may be restarted.
Initial Throttle:	6
Current Throttle:	4
Transfer Count:	158720
Percent Complete:	3
Start Time:	10/12/06 16:54:57
Completion Time:	10/12/06 16:59:44
Duration	4 min. 47 sec
Failure Status:	N/A

Copy Descriptor name	ses_change_ar
Copy Descriptor ID:	1
Owner	SP B
Copy Descriptor Type	Full
Source LUN WWN:	60:06:01:60:72:70:18:00:C4:AD:19:66:0E:5A:DB:11
Source PortWWN and LUN	N/A
Number of Blocks to Copy:	4194304
Number Of Destinations:	1
Destination LUN WWN:	60:06:01:60:72:70:18:00:C45AD:19:66:0E:5A:DB:11
Destination PortWWN and LUN	N/A
Session Status:	Session is paused.
Initial Throttle:	6
Current Throttle:	6

Transfer Count:	799744
Percent Complete:	19
Start Time:	10/12/06 17:17:37
Completion Time:	N/A
Duration	N/A
Failure Status:	No Failure
Copy Descriptor Name:	SAN000_10.6.84.185_00_p1608
Copy Descriptor ID:	21646
Copy Descriptor Type:	Full
Source LUN WWN:	60:06:01:60:E3:FA:15:00:0E:4E:70:A1:8B:C5:DA:11
Source PortWWN and LUN:	60:06:01:60:E3:FA:15:00:0E:4E:70:A1:8B:C5:DA:11
Number of Blocks to Copy:	2097152
Number Of Destinations:	1
Destination LUN WWN:	60:06:01:60:E3:FA:15:00:0F:4E:70:A1:8B:C5:DA:11
Destination PortWWN and LUN:	N/A
Session Status:	Complete
Initial Throttle:	4
Current Throttle:	4
Transfer Count:	2097152
Percent Complete:	100
Start Time:	04/19/06 09:55:39
Completion Time:	04/19/06 09:55:57
Duration	18 sec
Failure Status:	No Failure

OUTPUT

If the version of FLARE software running on the SP does not support this command, a `Command is not supported` error message is printed to **`stderr`**.

sancopy -mark

For incremental sessions only--Makes a point-in-time copy of changes to the source logical unit since the last copy session.

PREREQUISITES

For naviseccli, you must have a user account on the system on which you want to execute the command.

For navicli, you must have a username/host entry in the Unisphere SP agent configuration file to use this command.

DESCRIPTION

The **naviseccli** or **navicli** sancopy command with **-mark** creates a point-in-time copy of the changes that have taken place since the last copy session up to the time the session is marked. You can mark the session at any time before you start the session, or SAN Copy will mark the session at the time the session starts. When you start a marked session, all changes made to the source LUN up to the time of the mark will be copied to the destination logical units.

Note: Before marking the session, make sure that you prepare the source logical unit as described in the section, Preparing logical units for a SAN Copy session on page 917. Once you receive confirmation that the mark operation was successful, you can resume I/O to the source logical unit.

SYNTAX

sancopy -mark -descriptorid *descriptorid*|**-name** *sessionName*

OPTIONS

-descriptorid *descriptorid* | **-name** *sessionName*

Identifies the session you want to mark.

EXAMPLE

This command marks the SAN Copy session named **monday**. When the session is started, it copies only the changes to the source logical unit that have taken place since the last copy session up to the time of the mark.

```
naviseccli -h 10.11.22.33 sancopy -mark -name monday
```

Note: To use this command with **navicli**, replace **naviseccli** with **navicli**.

OUTPUT

If the version of FLARE software running on the SP does not support this command, a **`Command is not supported`** error message is printed to **`stderr`**. Other errors are:

```
DMF_NAME_AND_UID_SPECIFIED

DMF_NAME_OR_UID_REQUIRED

DMF_UNKNOWN_DESCRIPTOR
```

sancopy -modify

Changes the definitions for a copy session

PREREQUISITES

For naviseccli, you must have a user account on the system on which you want to execute the command.

For navicli, you must have a username/host entry in the Unisphere SP agent configuration file to use this command.

DESCRIPTION

The **naviseccli** or **navicli** sancopy command with **-modify** changes an existing SAN Copy session. This command will fail if the session has started or is in the paused state. You must stop the session before modifying the session. This command supports thin LUNs only when the system executing the CLI command (or the target system) is running a committed bundle that supports San Copy with thin LUNs.

The new session information will not take effect until you start a new session.

You must include a copy descriptor ID or name and one or more switches to indicate changes.

Note: If you are modifying an incremental SAN Copy session, the following optional switches are available: **-copywholelun**, **-chglinkbw**, and **-chglatency**.

SYNTAX

```
sancopy -modify -descriptorid descriptor-id | -name name [ -adddestbywwn
dest-lun-wwn ]
[ -adddestbylunnumber destsp destlunnumber ]
[-adddestbyportwwn destportwwn destlunnumber ]
[-chgdestconnectiontypebywwn destwwn ]
[-chgdestconnectiontypebylunnumber destspname destlunmumber]
[ -chgname newname ]
[ -chgsrcbylunnumber srcspname srclunnumber ]
[ -chgsrcbywwn srcwwn ]
[ -chgsrcbyportwwn srcportwwn srclunnumber ]
[-chgsrcconnectiontype srcwwn ]
[ -chgsessiontype ]
[-o ]
[-rmdestbylunnumber destsp destlunnumber ]
[ -rmdestbywwn dest-lun-wwn ]
[-rmdestbyportwwn destportwwn destlunnumber]
[ -throttle n ]
```

OPTIONS

-descriptorid *descriptor-id* | **-name** *name*

Identifies the descriptor you want to change.

-adddestbywwn *dest-lun-wwn*

Adds a destination logical unit to the descriptor by World Wide Name.

By default, the connection type for the specified logical unit will be set to **fibrepreferred**. This sets the connection type to fibre or iSCSI (if fibre path could not be found) each time you start or resume a session. You can change the connection type using one of the following switches: **-fibre** or **-iscsi**.

Note: If the logical unit does not reside in a remote system, setting the connection type will be ineffective.

-fibre

Sets the logical unit's connection type to fibre.

-iscsi

Sets the logical unit's connection type to iSCSI.

-adddestbylunnumber *destsp destlunnumber*

Adds a destination logical unit to the descriptor by destination SP (specify the SP name or IP address) and destination logical unit number.

By default, the connection type for the specified logical unit will be set to **fibrepreferred**. This sets the connection type to fibre or iSCSI (if fibre path could not be found) each time you start or resume a session. You can change the connection type with one of the following switches: **-fibre** or **-iscsi**.

Note: If the logical unit does not reside in a remote system, setting the connection type will be ineffective.

-fibre

Sets the logical unit's connection type to fibre.

-iscsi

Sets the logical unit's connection type to iSCSI.

-adddestbyportwwn *destportwwn destlunnumber*

Adds only destination logical units that reside in supported non-EMC systems. For *destportwwn*, specify the World Wide Name of the SP port on the destination system that owns the destination LUN; for *destlunnumber* specify the number of the destination LUN.

-chgdestconnectiontypebywwn *destwwn*

Changes the connection type of the destination logical unit using its World Wide Name, *destwwn*.

You can change the connection type of the logical unit using one of the following switches: **-fibre**, **-iscsi**, or **-fibrepreferred**.

Note: If the destination logical unit does not reside in a remote system, setting the connection type will be ineffective.

-fibre

Sets the destination logical unit's connection type to fibre.

-iscsi

Sets the destination logical unit's connection type to iSCSI.

-fibrepreferred

Sets the destination logical unit's connection type to fibre or iSCSI (if fibre path could not be found).

-chgdestconnectiontypebylunnumber *destspname destlunnumber*

Changes the connection type of the destination logical unit using its destination SP (specify the SP name or IP address), *destspname*, and its destination logical unit number, *destlunnumber*.

You can change the connection type of the logical unit with one of the following switches: **-fibre**, **-iscsi**, or **-fibrepreferred**.

Note: If the destination logical unit does not reside in a remote system, setting the connection type will be ineffective.

-fibre

Sets the destination logical unit's connection type to fibre.

-iscsi

Sets the destination logical unit's connection type to iSCSI.

-fibrepreferred

Sets the destination logical unit's connection type to fibre or iSCSI (if a fibre path could not be found).

-chgname *newname*

Note: Not available for incremental sessions.

Changes the descriptor name to newname.

-chgsrcbylunnumber *srcspname srclunnumber*

Note: Not available for incremental sessions.

Changes the source logical unit in the session owned by source SP (for srcspname, specify the SP name or IP address) and source logical unit number.

By default, the connection type for the specified source logical unit will be set to **fibrepreferred**. This sets the connection type to fibre or iSCSI (if fibre path could not be found) each time you start or resume a session. You can change the connection type with one of the following switches: **-fibre** or **-iscsi**.

Note: If the source logical unit does not reside in a remote system, setting the connection type will be ineffective.

-fibre

Sets the source logical unit's connection type to fibre.

-iscsi

Sets the source logical unit's connection type to iSCSI.

-chgsrcbywwn *srcwwn*

Note: Not available for incremental sessions.

Changes the source logical unit in the descriptor using the World Wide Name of the new source logical unit.

By default, the connection type for the specified source logical unit will be set to **fibrepreferred**. This sets the connection type to fibre or iSCSI (if a fibre path could not be found) each time you start or resume a session. You can change the connection type with one of the following switches: **-fibre** or **-iscsi**.

Note: If the source logical unit does not reside in a remote system, setting the connection type will be ineffective.

-fibre

Sets the source logical unit's connection type to fibre.

-iscsi

Sets the source logical unit's connection type to iSCSI.

-chgscrbyportwwn *srcportwwn srclunnumber*

Valid only for changing source logical units that reside in supported non-EMC systems. For *srcportwwn*, specify the World Wide Name of the SP port on the source system that owns the source LUN; for *srclunnumber* specify the number of the source LUN.

-chgsrcconnectiontype srcwwn

Changes the connection type of the source logical unit using its World Wide Name (**srcwwn**).

You can change the connection type of the logical unit with one of the following switches: **-fibre**, **-iscsi**, or **-fibrepreferred**.

Note: If the logical unit does not reside in a remote system, setting the connection type will be ineffective.

-fibre

Sets the session connection type to fibre.

-iscsi

Sets the session connection type to iSCSI.

-fibrepreferred

For connections between combo systems (Fibre Channel and iSCSI), sets the connection type to fibre, if possible. If not possible, uses iSCSI.

-chgsessiontype

Changes the type of the SAN Copy session — incremental or full.

If you change the session type from full to incremental, the following optional switches are available: **-changesonly**, **-linkbw**, and **-latency**.

-changesonly

If the source LUN and destination LUNs are synchronized, use this switch. When you start the session, SAN Copy will copy only the changes that have occurred to the source LUN since the initial synchronization, and any subsequent sessions will copy only the changes.

If the source LUN and destination LUNs are not synchronized (or you are unsure of the copy state), do not use this switch. The first time you run the session, SAN Copy will copy the entire source LUN to the destination LUNs. Any subsequent sessions will copy only the changes.

-linkbw

Specifies the available link bandwidth for the copy session. You can use the entire bandwidth of your network connection for incremental SAN Copy sessions, or you can specify only a portion of it. For CX3 series systems, the minimum allowable value is .016 megabits per second (mbps) and the maximum value is 4096 mbps. For all other CX series systems, the minimum allowable value is .016 megabits per second (mbps) and the maximum value is 2048 mbps. The default value is .15 mbps (equivalent to a T1 line).

-latency

Specifies the latency value for the incremental session. Latency is the amount of time it takes to transmit a block of data to its destination expressed in milliseconds. Valid values are auto (SAN Copy computes the latency value), or a decimal number with no maximum limit. The default value is auto. Entering a 0 latency value is the equivalent to entering auto.

Note: If you create and start incremental sessions, and the copy is performed over a link that is slower than Fibre Channel, SAN Copy uses the link bandwidth and latency values to calculate the optimum buffer space for the session.

-o

Suppresses a confirmation message describing the descriptor.

-rmdestbylunnumber *destsp destlunnumber*

Removes a destination logical unit from the specified descriptor by destination SP (specify the SP name or IP address) and destination logical unit number.

-rmdestbywwn *dest-lun-wwn*

Removes a destination logical unit from the specified descriptor by World Wide Name.

-rmdestbyportwwn *destportwwn destlunnumber*

Valid only for removing destination logical units that reside in supported non-EMC systems. For *destportwwn*, specify the World Wide Name of the SP port on the destination system that owns the destination LUN; for *destlunnumber* specify the number of the destination LUN.

-throttle n

Changes the I/O rate to n (valid values 1 through 10). The default value is 6. To change the throttle value of an active session, use the command sancopy -throttle.

For incremental SAN Copy sessions, the following optional switches are available.

-copywholelun

Specifies that SAN Copy copy the entire contents of the source logical unit the next time the session is run.

-chglinkbw

Changes the link bandwidth for the specified session.

For CX3 series systems, the minimum allowable value is .016 megabits per second (mbps) and the maximum value is 4096 mbps. For all other CX series systems, the minimum allowable value is .016 megabits per second (mbps) and the maximum value is 2048 mbps. The default value is .15 mbps (equivalent to a T1 line).

-chglatency

Changes the latency value for the specified session. Latency is the amount of time it takes to transmit a block of data to its destination expressed in milliseconds. Valid values are auto (SAN Copy computes the latency value), or a decimal number with no maximum limit. The default value is auto.

EXAMPLE

For SP **ss1_spa**, copy descriptor copy_66 is a full copy session. This command adds the destination logical unit whose World Wide Name is 60:06:01:6B:61:09:00:00:6A:6F:9F:ED:0B:A3:D6:11. For SP **ss1_spa**, copy descriptor copy_77 is an incremental copy session. The next time session copy_77 is run, SAN Copy will copy the contents of the entire source LUN to the destinations.

Note: To use this command with **navicli**, replace **naviseccli** with **navicli**.

```
naviseccli -h ss1_spa sancopy -modify -name copy_66 -adddestbywwn
60:06:01:6B:61:09:00:00:6A:6F:9F:ED:0B:A3:D6:11

naviseccli -h ss1_spa sancopy -modify -name copy_77 -copywholelun
```

OUTPUT

If the version of FLARE software running on the SP does not support this command, a `Command is not supported` error message is printed to **`stderr`**. Other errors are:

```
DMF_NAME_AND_UID_SPECIFIED

DMF_NAME_OR_UID_REQUIRED

DMF_UNKNOWN_DESCRIPTOR
DMF_INVALID_THROTTLE_VALUE

DMF_REMOVED_DEST_DOESNOT_EXIST
```

Errors returned from the driver or agent are:

```
UNKNOWN_DESCRIPTOR_ID

UNKNOWN_DESCRIPTOR_NAME

SESSION_NAME_EXISTS
```

sancopy -pause

Suspends I/O in an active SAN Copy session

PREREQUISITES

For naviseccli, you must have a user account on the system on which you want to execute the command.

For navicli, you must have a username/host entry in the Unisphere SP agent configuration file to use this command.

DESCRIPTION

The **naviseccli** or **navicli** sancopy command with **-pause** pauses an existing SAN Copy session. You must specify the descriptor ID or name.

To continue the paused session, use the **sancopy -resume** function.

SYNTAX

sancopy -pause -descriptorid *descriptor* **-id**|**-name** *name*

OPTIONS

-descriptorid *descriptor-id* | **-name** *name*

Identifies the descriptor whose session you want to pause.

EXAMPLE

For SP **ss1_spa**, this command pauses the session with the **copy_lun_ 66** descriptor.

```
naviseccli -h ss1_spa sancopy -pause -name copy_lun_66
```

Note: To use this command with **navicli**, replace **naviseccli** with **navicli**.

OUTPUT

If the version of FLARE software running on the SP does not support this command, a `Command is not supported` error message is printed to **stderr**. Other errors are:

```
DMF_NAME_AND_UID_SPECIFIED

DMF_NAME_OR_UID_REQUIRED
DMF_UNKNOWN_DESCRIPTOR
```

Errors returned from the driver or agent are:

```
UNKNOWN_DESCRIPTOR_ID

UNKNOWN_DESCRIPTOR_NAME
INVALID_SIZE
```

sancopy -remove

Deletes a copy session.

PREREQUISITES

For naviseccli, you must have a user account on the system on which you want to execute the command.

For navicli, you must have a username/host entry in the Unisphere SP agent configuration file to use this command.

DESCRIPTION

The **naviseccli** or **navicli** sancopy command with **-remove** deletes one or all previously stored copy sessions. A copy session cannot be removed if it is currently active. An active copy session must complete the copy first or be stopped.

If you omit the override **-o** option, the CLI displays a message asking you to confirm the removal of the copy session.

This command can use only one of the following switches at a time: **-descriptorid**; **-name**; **-all**

SYNTAX

sancopy -remove -descriptorid *descriptor*-**id**| **-name** *name*| **-all** [**-o**]

OPTIONS

-descriptorid *descriptor-id* | **-name** *name*

Identifies the descriptor you want to remove.

-all

Directs the CLI to remove all descriptors on the SP.

-o

Suppresses a message confirming the removal of the descriptor.

EXAMPLE

For SP **ss1_spa**, this command deletes the copy descriptor named **copy_lun_80**.

```
naviseccli -h ss1_spa sancopy -remove -name copy_lun_80
```

Note: To use this command with **navicli**, replace **naviseccli** with **navicli**.

```
Do you really want to remove the copy descriptor(y/n)[n]? y
```

OUTPUT

If the version of FLARE software running on the SP does not support this command, a `Command is not supported` error message is printed to **stderr**. Other errors are:

`DMF_NAME_AND_UID_SPECIFIED`

`DMF_NAME_OR_UID_REQUIRED`

`DMF_UNKNOWN_DESCRIPTOR`

Errors returned from the driver or agent are: `UNKNOWN_DESCRIPTOR_ID`

sancopy -resume

Continues I/O in a SAN Copy session

PREREQUISITES

For naviseccli, you must have a user account on the system on which you want to execute the command.

For navicli, you must have a username/host entry in the Unisphere SP agent configuration file to use this command.

DESCRIPTION

The **naviseccli** or **navicli** sancopy command with **-resume** resumes an existing SAN Copy session that was paused, stopped, or failed. If the copy session was paused, it will start at the paused point.

If the copy session was stopped or failed, the **-resume** command will restart the copy session from the latest checkpoint (explained in the settings command). If the checkpoint feature is disabled (the checkpoint was set to disable), the copy session will restart from the beginning.

You must specify the descriptor ID or name.

SYNTAX

sancopy -resume -descriptorid *descriptor-id* | **-name** *name*

OPTIONS

-descriptorid *descriptor-id* | **-name** *name*

Identifies the descriptor whose session you want to resume.

EXAMPLE

For SP **ss1_spa**, this command resumes the **sancopy_lun_66** copy session.

```
naviseccli -h ss1_spa sancopy -resume -name copy_lun_66
```

Note: To use this command with **navicli**, replace **naviseccli** with **navicli**.

OUTPUT

If the version of FLARE software running on the SP does not support this command, a `Command is not supported` error message is printed to **stderr**. Other error messages are:

```
DMF_NAME_AND_UID_SPECIFIED

DMF_NAME_OR_UID_REQUIRED
DMF_UNKNOWN_DESCRIPTOR
```

Errors returned from the driver or agent are:

```
UNKNOWN_DESCRIPTOR_ID
UNKNOWN_DESCRIPTOR_NAME
SESSION_ALREADY_IN_PROGRESS
```

sancopy -settings

Lists or changes SAN Copy environmental parameters

PREREQUISITES

For naviseccli, you must have a user account on the system on which you want to execute the command.

For navicli, you must have a username/host entry in the Unisphere SP agent configuration file to use this command.

DESCRIPTION

The **naviseccli** or **navicli** sancopy command with **-settings** gets and sets four SAN Copy environmental control parameters :

- the maximum number of concurrent active sessions
- a checkpoint interval for session status
- number of buffers per session
- buffer size

To find the current settings, use the **-list** switch; to change a setting, omit **-list** and specify the setting.

If you do not change the setting specifications, the software uses default values.

SYNTAX

```
sancopy -settings -list

sancopy -settings [-setmax MaxNumSessions]
[-setcheckpoint CheckpointInterval]
[-setbufsize buffersize]
[-setbufnum buffervalue]
```

OPTIONS

-list

Displays the current environmental parameter settings.

-setmax *maxNumSessions*

Sets the maximum number of SAN Copy sessions. The maximum number of sessions depends on the system type.

Storage-system type	Maximum no. of sessions
CX3-series model 80 system, CX3-series model 40 systems, CX600, CX700	16 (8 per SP)
CX3-series model 20 systems, CX400, CX500	8 (4 per SP)

-setcheckpoint *CheckpointInterval*

Sets the checkpoint interval in minutes (values 5, 10, 15, 20, 25, 30, 35, 40, 45, 50, 55, 60, 65, 70, 75, 80, 85, or 90) or, with the literal Disable, disables the checkpoint feature. By default, checkpointing is enabled with a value of 10 minutes.

The SAN Copy software can track the progress of a copy session by checkpoint interval. If a session fails while checkpointing is enabled, then after correcting the problem, you can direct the software to resume (**-resume** function). It will continue copying from the last checkpoint, if possible. If checkpointing is disabled, or if resuming is not possible, you can start copying from the beginning.

-setbufsize *buffersize*

Specifies the maximum buffer size to be used by SAN Copy sessions on a Fibre Channel connection. The default buffer size is 1024 blocks. The minimum buffer size is 64 KB.

-setbufnum *buffernumber*

Specifies the maximum number of buffers to be used by SAN Copy sessions on a Fibre Channel connection. The default number is 4, and the minimum is 1.

EXAMPLE

For SP **ss1_spa**, this command lists the current value for maximum number of sessions, checkpoint interval, number of buffers per session, and buffer size. For SP **ss1_spa**, this command changes the checkpoint interval to 45 minutes. For SP **ss1_spa**, this command changes the number of buffers to 3.

Note: To use this command with **navicli**, replace **naviseccli** with **navicli**.

```
naviseccli -h ss1_spa sancopy -settings -list

naviseccli -h ss1_spa sancopy -settings -setcheckpoint 45

naviseccli -h ss1_spa sancopy -settings -setbufnum 3
```

OUTPUT

If the version of FLARE software running on the SP does not support this command, a `Command is not supported` error message is printed to **`stderr`**. Other errors are:

`DMF_LIST_AND_SET_SPECIFIED` `DMF_INVALID_MAX_SESSION_VALUE` `DMF_INVALID_CHECKPOINT_INTERVAL_VALVE`

Errors returned from driver or agent are:

`SESSION_MAX_OVER_LIMIT` `SESSION_POLL_OVER_LIMIT`

sancopy -start

Starts a SAN Copy session based on values in a copy descriptor

PREREQUISITES

For naviseccli, you must have a user account on the system on which you want to execute the command.

For navicli, you must have a username/host entry in the Unisphere SP agent configuration file to use this command.

DESCRIPTION

The **naviseccli** or **navicli** sancopy command with **-start** starts a SAN Copy session with the source and destination logical unit(s) identified in the copy descriptor. You can start a session using the descriptor ID or name.

The command works only when issued to the SP that owns the copy descriptor.

The **sancopy -info** command provides useful information for the **sancopy -start** command.

Note: Before starting a copy session, make sure you prepare the source and destination logical units as described in the section, Preparing logical units for a SAN Copy session on page 917 . When you start a SAN Copy session , SAN Copy automatically allocates and retains additional memory. This additional memory counts against the total replication software memory budget.

SYNTAX

sancopy -start -descriptorid *descriptor-id* | **-name** *name* [**-copywholelun** [**-nomark** *new* | all]]

OPTIONS

-descriptorid *descriptor-id* | **-name** *name*

Identifies the copy descriptor for the session you want to start.

For incremental SAN Copy sessions, the following optional switches are available.

-copywholelun

Specifies that this incremental session will copy the entire contents of the source logical unit to all the destination logical units. To use this command the session must be unmarked. When you start the session using this command, SAN Copy will mark the session for you. This command overrides any existing settings for the session.

-nomark *new*|*all*

Used with the **-copywholelun** switch, and works only if the session is not already marked. Specifies that this session will not be marked when it is started. A session run with the **-copywholelun -nomark** command completes more quickly, but at the end of the session, the source and destination logical units are inconsistent. To make them consistent, you must run the session again.

When **-nomark** is used with the *new* option, SAN Copy starts an unmarked session that copies the contents of the source logical unit to any new destinations.

When **-nomark** is used with the *all* option, SAN Copy starts an unmarked session that copies the contents of the source logical unit to all destinations.

EXAMPLE

For SP **ss1_spa**, this command starts a copy session based on the copy descriptor named **copy_lun_66**.

```
naviseccli -h ss1_spa sancopy -start -name copy_lun_66
```

Note: To use this command with **navicli**, replace **naviseccli** with **navicli**.

OUTPUT

If the FLARE software running in the SP does not support the command, the CLI prints a `Command is not supported` error message to **stderr**. Other errors are:

`DMF_NAME_AND_UID_SPECIFIED` `DMF_NAME_OR_UID_REQUIRED` `DMF_UNKNOWN_DESCRIPTOR`

Errors returned from the driver or agent are:

`UNKNOWN_DESCRIPTOR_ID` `UNKNOWN_DESCRIPTOR_NAME` `SESSION_ALREADY_IN_PROGRESS`

sancopy -stop

Stops (terminates) a SAN Copy session

PREREQUISITES

For naviseccli, you must have a user account on the system on which you want to execute the command.

For navicli, you must have a username/host entry in the Unisphere SP agent configuration file to use this command.

DESCRIPTION

The **naviseccli** or **navicli** sancopy command **-stop** terminates the specified session. The session stops automatically when it is complete, so this command is not needed in the normal course of SAN Copy operations.

SYNTAX

sancopy -stop -descriptorid *descriptor-id* | **-name** *name*

OPTIONS

-descriptorid *descriptor-id* | **-name** *name*

Identifies the descriptor whose session you want to stop.

EXAMPLE

For SP **ss1_spa**, this command stops the copy session with the copy descriptor name **copy_lun_66**.

```
naviseccli -h ss1_spa sancopy -stop -name copy_lun_66
```

Note: To use this command with **navicli**, replace **naviseccli** with **navicli**.

OUTPUT

If the version of FLARE software running on the SP does not support this command, a `Command is not supported` error message is printed to **stderr**. Other error messages are:

`DMF_NAME_AND_UID_SPECIFIED` `DMF_NAME_OR_UID_REQUIRED` `DMF_UNKNOWN_DESCRIPTOR`

Errors returned from the driver or agent are:

`UNKNOWN_DESCRIPTOR_ID` `UNKNOWN_DESCRIPTOR_NAME`

sancopy -throttle

Changes the I/O rate of an active copy descriptor

PREREQUISITES

For naviseccli, you must have a user account on the system on which you want to execute the command.

For navicli, you must have a username/host entry in the Unisphere SP agent configuration file to use this command.

DESCRIPTION

The **naviseccli** or **navicli** sancopy command with **-throttle** lets you change the throttle of an existing, running copy descriptor. The new throttle value is valid only while the session is running and will not change the value in the descriptor database.

To change the throttle value of an existing copy descriptor that is not running, use the **sancopy -modify -throttle** command (see sancopy -modify on page 944)

SYNTAX

sancopy -throttle -descriptorid *descriptor-id* | **-name** *name* **n**

OPTIONS

-descriptorid *descriptor-id* | **-name** *name*

Identifies the descriptor whose throttle value you want to change.

n

Is the new throttle value, ranging from 1 (slowest) to 10 (highest). The default value is 6.

EXAMPLE

For SP **ss1_spa** descriptor **copy_lun_66** , this command displays information, including throttle information. For SP **ss1_spa** descriptor **copy_lun_66**, these commands get information (including throttle value), then change the throttle value to 8.

Note: To use this command with **navicli**, replace **naviseccli** with **navicli**.

```
naviseccli -h ss1_spa sancopy -info -name copy_lun_66

naviseccli -h ss1_spa sancopy -throttle -name copy_lun_66 8
```

OUTPUT

If the version of FLARE software running on the SP does not support this command, a `Command is not supported` error message is printed to **`stderr`**. Other errors are:

`DMF_NAME_AND_UID_SPECIFIED` `DMF_NAME_OR_UID_REQUIRED` `DMF_INVALID_THROTTLE_VALUE` `DMF_UNKNOWN_DESCRIPTOR`

Errors returned from the driver or agent are:

`UNKNOWN_DESCRIPTOR_ID` `UNKNOWN_DESCRIPTOR_NAME`

sancopy -transfer

Transfers a copy descriptor from the peer SP

PREREQUISITES

For naviseccli, you must have a user account on the system on which you want to execute the command.

For navicli, you must have a username/host entry in the Unisphere SP agent configuration file to use this command.

DESCRIPTION

The **naviseccli** or **navicli** sancopy command with **-transfer** moves the specified descriptor from the peer SP to the SP you specify in the command.

After transferring the copy descriptor, you can start a new session on the working SP using that descriptor.

SYNTAX

sancopy -transfer -descriptorid *descriptor-id* | **-name** *name*

OPTIONS

-descriptorid *descriptor-id* | **-name** *name*

Identifies the descriptor you want to transfer to the working SP.

EXAMPLE

This command transfers the copy descriptor **copy_lun_66** to the SP named **ss1_spb**.

```
naviseccli -h ss1_spb sancopy -transfer -name copy_lun_66
```

Note: To use this command with **navicli**, replace **naviseccli** with **navicli**.

OUTPUT

If the version of FLARE software running on the SP does not support this command, a `Command is not supported` error message is printed to **stderr**. Other errors are:

`DMF_NAME_AND_UID_SPECIFIED` `DMF_NAME_OR_UID_REQUIRED` `DMF_UNKNOWN_DESCRIPTOR` `DMF_PEER_SP_ALIVE`

Errors returned from the driver or agent are:

```
UNKNOWN_DESCRIPTOR_ID UNKNOWN_DESCRIPTOR_NAME
```

sancopy -unmark

For incremental sessions only--Removes the point-in-time copy from a marked incremental SAN Copy session

PREREQUISITES

For naviseccli, you must have a user account on the system on which you want to execute the command.

For navicli, you must have a username/host entry in the Unisphere SP agent configuration file to use this command.

DESCRIPTION

The **naviseccli** or **navicli** sancopy command with **-unmark** removes the point-in-time copy from a marked incremental SAN Copy session.

Note: You cannot unmark a session if any of the session's destination logical units have failed.

SYNTAX

sancopy -unmark -descriptorid *descriptor-id* | **-name** *name*

OPTIONS

-descriptorid *descriptor-id* | **-name** *name*

Identifies the session you want to unmark.

EXAMPLE

This command removes the mark from the incremental copy session named **monday**.

```
naviseccli -h 10.11.22.33 sancopy -unmark -name monday
```

Note: To use this command with **navicli**, replace **naviseccli** with **navicli**.

OUTPUT

If the version of FLARE software running on the SP does not support this command, a `Command is not supported` error message is printed to **stderr**. Other errors are:

`DMF_NAME_AND_UID_SPECIFIED` `DMF_NAME_OR_UID_REQUIRED` `DMF_UNKNOWN_DESCRIPTOR`

sancopy -updateconnections

Updates connection and registration information

PREREQUISITES

For naviseccli, you must have a user account on the system on which you want to execute the command.

For navicli, you must have a username/host entry in the Unisphere SP agent configuration file to use this command.

DESCRIPTION

The **naviseccli** or **navicli** sancopy command with **-updateconnections** updates registration information for all attached systems.

You should run this command for each SP.

SYNTAX

```
sancopy -updateconnections
```

EXAMPLE

These commands update connections on both SPs, **ss1_spa** and **ss1_spb**.

```
naviseccli -h ss1_spa sancopy -updateconnections naviseccli -h ss1_spb sancopy -updateconnections
```

Note: To use this command with **navicli**, replace **naviseccli** with **navicli**.

sancopy -verify

Ensures that the SAN Copy software can access a logical unit

PREREQUISITES

For naviseccli, you must have a user account on the system on which you want to execute the command.

For navicli, you must have a username/host entry in the Unisphere SP agent configuration file to use this command.

DESCRIPTION

The **naviseccli** or **navicli** sancopy command with **-verify** ensures that the SAN Copy software can access a logical unit. You should issue the command to both SPs as one SP might have access, where the other does not.

SYNTAX

sancopy -verify -wwn *lun-wwn* | **-lunnumber** *sp-name lunnumber* [**-device** *devicename*]
[**-log**]
[**-iscsi**|**-fibre**]

OPTIONS

-wwn *lun-wwn*

Specifies the World Wide Name of the logical units. You can specify more than one WWN.

-lunnumber *sp-name lunnumber*

An alternate way of specifying a logical unit. For *sp-name*, specify the SP hostname (or SP IP address). For *lunnumber*, specify the source or destination logical unit number. You can specify more than one LUN number.

-device *devicename*

Specifies the system device name. This switch is required for FC4500 and FC5400 systems. Omit it for CX series systems.

-log

Logs events to the SP event log.

Note: If SAN Copy cannot find a LUN on a remote system, use these events to help determine the reason.

-iscsi | -fibre

Specifies which connection type to use to verify the connection. If a connection type is not specified, fibre is used first to verfiy the connection, and if no connection is found, iSCSI is used.

EXAMPLE

The example below uses the LUN's World Wide Name to verify that the LUN is reachable, and logs any events to the SP event log. If the LUN is reachable, the software displays the following message: This example verifies two LUNs using the SP name and LUN number. If one or both LUNs are not reachable, the software displays a message similar to the following:

```
Storage device is reachable.

Error: sancopy command failed
Error returned from Agent SP A: CPM unable to locate device. Check that the
device with this WWN exists (0x712ac007)
```

Note: To use this command with **navicli**, replace **naviseccli** with **navicli**.

```
 naviseccli -h 11.12.13.14 sancopy -verify -wwn
60:06:01:FA:2C:09:00:00:2B:89:4C:E9:65:D7:11
  -log

naviseccli -h 11.12.13.14 sancopy -verify -lunnumber 12.34.56.78 6
  12.34.56.78 12
```

12

EMC SnapView Software

This chapter introduces the EMC® SnapView™ software and its user interface, as well as the two command line interfaces for it. The command line interfaces include the server-based admsnap utility and the EMC Navisphere® CLI interface.

Note: Unless indicated otherwise, references to LUNs include traditional LUNs (FLARE® and metaLUNs) and thin LUNs.

If your system includes FAST Cache (solid state disk drives with flash memory, or SSD drives), refer to the Best Practices documentation for information on using these disks with SnapView, which is available on the EMC Powerlink® website: Home > Support > Technical Documentation and Advisories > White Papers > Configuration/Administration.

Major topics are:

Introduction to SnapView

SnapView is a system-based software application that allows you to create a copy of a traditional or thin LUN by using either clones or snapshots.

A clone is an actual copy of a LUN and takes time to create, depending on the size of the source LUN. A snapshot is a virtual point-in-time copy of a LUN, which tracks differences to your original data, and takes only seconds to create.

SnapView has the following important benefits:

- It allows full access to a point-in-time copy of your production data with modest impact on performance and without modifying the actual production data.
- For decision support or revision testing, it provides a coherent, readable and writable copy of real production data.
- For backup, it practically eliminates the time that production data spends offline or in hot backup mode. And it offloads the backup overhead from the production server to another server.
- It provides a consistent replica across a set of LUNs. You can do this by performing a consistent fracture, which is a fracture of more than one clone at the same time, or a consistent session that you create when starting a session in consistent mode.
- It provides instantaneous data recovery if the source LUN becomes corrupt. You can perform a recovery operation on a clone by initiating a reverse synchronization and on a snapshot session by initiating a rollback operation.

Depending on your application needs, you can create clones, snapshots, or snapshots of clones. For a detailed overview on clones, refer to the Clones overview on page 974. For a detailed overview on snapshots, refer to the Snapshots overview on page 975. For a comparison of using clones, snapshots, and snapshots of clones, refer to Clone and snapshot comparison on page 976.

Clones overview

A clone is a complete copy of a source LUN. You specify a source LUN when you create a clone group. The copy of the source LUN begins when you add a clone LUN to the clone group. The software assigns a clone ID to each clone. This ID remains with the clone until you remove the clone from its group.

While the clone is part of the clone group and unfractured, any production write requests made to the source LUN are simultaneously copied to the clone. Once the clone contains the desired data, you can fracture the clone. Fracturing the clone separates it from its source LUN, after which you can make it available to a secondary server.

Clone private LUNs track areas on the source and clone that have changed since the clone was fractured. A log records information that identifies data chunks on the source LUN and clone LUN that have been modified after you fractured the clone. A modified (changed)

data chunk is a chunk of data that a production or secondary server changes by writing to the source LUN or clone. A log in the clone private LUN records this information, but no actual data is written to the clone private LUN. This log reduces the time it takes to synchronize or reverse synchronize a clone and its source LUN since the software copies only modified chunks.

Important: Clone private LUNs must be RAID group LUNs (not thin LUNs or thick LUNs).

Figure 22 on page 975 shows an example of how a fractured clone works. Note, as the production server writes to the source LUN, and the secondary server writes to the clone, the clone private LUN tracks areas on the source and clone that have changed since the clone was fractured.

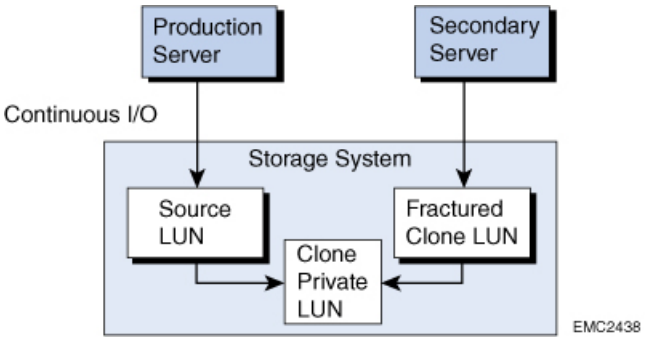


Figure 22. Clones example

To create a consistent replica across a set of LUNs, you can perform a consistent fracture, which fractures one clone at a time per source LUN across multiple source LUNs.

SnapView also allows you to instantly restore a clone back to the source LUN, if the source LUN were to become corrupt or if a clone's data is desired for the source. You can do this by initiating reverse synchronization on the clone.

Snapshots overview

A snapshot is a virtual LUN that allows a secondary server to view a point-in-time copy of a source LUN. You determine the point in time when you start a SnapView session. The session keeps track of the source LUN's data at a particular point in time. Though a snapshot appears as a conventional LUN to other servers, its data does not reside on a disk like a conventional LUN. A snapshot is a composite of the unchanged data chunks on the source LUN and data chunks on the reserved LUN. The data chunks on the source LUN are those that have not been modified since you started the session. The data chunks in the reserved LUN pool are copies of the original source LUN data chunks that have been modified since you started the session.

During a session, the production server can still write to the source LUN and modify data. When this happens, the software stores a copy of the original point-in-time data on a reserved

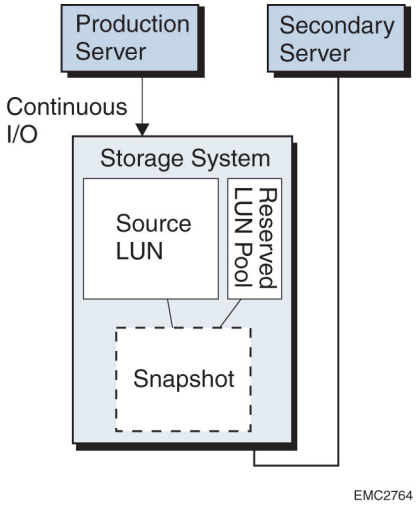
LUN in the reserved LUN pool. This operation is referred to as copy-on-first-write because it occurs only when a data chunk is first modified on the source LUN.

As the session continues and additional I/O modifies other data chunks on the source LUN, the amount of data stored in the reserved LUN pool grows. If needed, you can increase the size of the reserved LUN pool by adding more LUNs to the LUN pool.

Important: An adequate number of reserved LUNs is essential since SnapView terminates sessions if the reserved LUN runs out of space and no additional LUNs are in the reserved LUN pool.

From a secondary server, you can view a session's point-in-time data by activating (mapping) a snapshot to the session. You can activate only one snapshot at a time to a session. If another point-in-time view is desired, you can deactivate (unmap) a snapshot from a session and activate it to another session of the same source LUN or you can create another snapshot and activate it to the second session.

The figure below shows an example of how snapshots work. The snapshot is a composite of the source LUN and the reserved LUN in the global reserved LUN pool.



To create a consistent replica across a set of LUNs, you can start a session in consistent mode.

SnapView also allows you to instantly restore a session's point-in-time data back to the source LUN, if the source LUN were to become corrupt or if a session's point-in-time data is desired for the source. You can do this by using SnapView's rollback feature.

Clone and snapshot comparison

Table 24 on page 977 compares clones, snapshots, and snapshots of clones.

Note: The source LUN you specify when creating a clone group is available for server I/O during any clone state except for a reverse out-of-sync state. Any server writes made to the source LUN during a reverse synchronization are copied to the clone.

Table 24. A comparison of clones and snapshots

Clones	Snapshots	Snapshots of clones
Benefits		
◆ Provides immediacy in replacing the contents of the source LUN with the contents of the clone LUN and redirecting servers from the source to the clone, should the source become corrupted. ◆ Makes backup operations nondisruptive. ◆ Provides enhanced protection against critical data loss because it is an actual LUN.	◆ Provides immediacy in replacing the contents of the source LUN with the contents of the session, should the source LUN become corrupted. ◆ Makes backup operations nondisruptive. ◆ Provides a quick and instant copy because it is a virtual LUN.	◆ Provides immediacy in replacing the contents of the source LUN with the contents of the session, should the source LUN become corrupted. ◆ Makes backup operations nondisruptive. ◆ Provides an extra level of protection against critical data loss if both the source LUN and clone LUN become corrupted.
Creation time		
Minutes to hours. The creation time depends on the size of the source LUN. Subsequent synchronizations are incremental.	Instantaneous	Instantaneous
Disk space used		
Uses the same amount of disk space as the source LUN.	Uses reserved LUN pool space, which is usually 10% to 20% of the source LUN size per session, but will vary depending on how much data has changed on the source LUN.	Uses reserved LUN pool space (for the snapshot) and full disk space (for the clone), which usually totals 100% of the source LUN size for clones and 10% to 20% of the source LUN size per session, but will vary depending on how much data has changed on the source LUN.
Data recovery time after source LUN failure/corruption		
Instantaneous after initializing a reverse synchronization.	Instantaneous after initializing a rollback operation.	Combination of rollback from a session and reverse-synchronization of a clone.
Performance impact on the system		

Table 24. A comparison of clones and snapshots *(continued)*

Clones	Snapshots	Snapshots of clones
◆ There is no performance impact when a clone LUN is in a fractured state. ◆ For the initial synchronization of the clone LUN, there is a performance impact for the duration of the synchronization. Subsequent synchronizations or reverse synchronizations have comparable impact but the duration of the synchronization will be shorter since it is incremental. Impact is also determined by the synchronization rate, which is set when the clone LUN is added to the clone group and can be changed during a synchronization or reverse synchronization.	A performance decrease due to the copy-on-first-write.	Combination of both clone LUNs and snapshot LUNs.

SnapView components

SnapView consists of the following software components:

- A set of drivers that provides the SnapView functionality, and resides on the system with the LUNs you want to copy.

  Note: All CX4 series, CX3 series, or CX series systems ship from the factory with SnapView software installed, but not enabled. To use the SnapView software, the SnapView enabler must be installed on the system.

- The admsnap utility that provides a command line executable to let you manage clone and snapshot devices on the server. The admsnap utility ships with the SnapView enabler and resides on any servers connected to systems that have the SnapView software installed and enabled.

You must use SnapView with one of the following components:

- EMC Unisphere™ user interface (UI), which must be installed on at least one system on the same network as the SnapView system.

  Note: CX4 series, CX3 series, CX300 series, CX500 series, and CX700 systems ship from the factory with Unisphere installed and enabled. CX200, CX400, and CX600 systems ship from the factory with Unisphere installed, but not enabled. To use the Manager functionality on a CX200, CX400, or CX600 system, the Manager enabler must be installed on the system.

- Navisphere Command Line Interface (CLI), which ships as part of the Navisphere Host Agent packages.

You must use Unisphere or Navisphere CLI (not admsnap) to set up SnapView; then you can use admsnap and Unisphere and/or Navisphere CLI to manage ongoing SnapView operations.

About Unisphere

Unisphere is a centralized system management tool for configuring and managing EMC systems. It provides the following basic functionality:

- Discovery of systems
- Storage configuration and allocation
- Status and configuration information display
- Event management

Unisphere is a web-based user interface that lets you securely manage systems locally on the same LAN or remotely over the Internet, using a common browser. Unisphere resides on a CX4 series, CX3 series, or CX series system or a Microsoft Windows Server 2008, Windows Server 2003, or Windows 2000 server that is running the Storage Management Server software, and is downloaded to the browser when the Storage Management Server software is accessed.

For additional information on how to use SnapView with Unisphere, refer to the EMC Unisphere online help.

About Navisphere Express

Navisphere Express software is a system management tool used to manage AX4-5 series or AX series systems. It consists of the system integrated management software and a web-based user interface (UI). Both the management software and the UI are installed at the factory on the storage controllers in the system. The easy-to-use Navisphere Express UI is displayed in a common browser and provides the following:

- Security
- Storage configuration and allocation
- Data redundancy
- Status and configuration information display
- Event notification
- Data replication
- Data movement
- Data migration (AX4-5 series systems only)

For more information on these features, refer to the Navisphere Express online help.

About Navisphere CLI

The Navisphere CLI provides another management interface (along with Unisphere and admsnap) to clones and snapshots. You can use Navisphere CLI commands and admsnap commands together to manage clones and snapshots. You need both admsnap and Navisphere CLI because admsnap interacts with the server operating system and the CLI interacts with the system.

About the Admsnap utility

The admsnap utility is an executable program that you can run interactively or with a script to manage clones and snapshots. The admsnap utility resides on the servers connected to the system with the SnapView driver.

The admsnap utility runs on the following server platforms:

- Hewlett Packard HP-UX
- IBM AIX (RS/6000 and P series)
- Linux (32-bit Intel platform, 64-bit AMD processor Linux, 64-bit Intel Xeon processor, and 64-bit Intel Itanium processor)

  Note: Separate admsnap installation packages are available for the 32-bit Intel platform, 64-bit AMD processor Linux/64-bit Intel Xeon processor, and the 64-bit Intel Itanium processor. The admsnap packages for the 64-bit AMD processor Linux and the 64-bit Intel Xeon processor are the same. For minimum supported Linux kernel revisions for each platform, refer to the Admsnap Release Notes.

- Microsoft Windows (Windows Server 2008, Windows Server 2003, or Windows 2000)

  Note: Separate admsnap installation packages are available for Windows Server 2008, Windows Server 2003, and Windows 2000. Unless indicated otherwise, all references to a Windows server in this document refer to Windows Server 2008, Windows Server 2003, and Windows 2000 servers only. Scripts that run from Windows 2000 servers will not support the complete set of CX4 features. Refer to the ESM for more detailed information.

- Novell NetWare
- Sun Solaris
- VMware ESX Server

For the supported versions of these servers/operating systems, refer to the most up-to-date release notes for SnapView and admsnap.

Using SnapView with MirrorView

You can use SnapView with MirrorView™ software to create a clone or a snapshot of a remote mirror LUN (a LUN participating as either a primary or secondary image), which allows for protection at both the local and remote sites should either of these become corrupt. However, clones offer added disk protection and have less of a performance impact than snapshots.

If you have a database corruption at the local site, you can use the point-in-time clone or snapshot of the primary image to recover the data. To do this, you would use the instant restore capability of clones (reverse synchronization) or snapshots (rollback) so that the primary image can instantly restore the non-corrupted data.

At the remote site, creating a clone or a snapshot of a secondary image allows you to replace the mirror with the clone or snapshot in the event that a data corruption occurred across the mirrors.

Since clones offer less of a performance impact than snapshots, you could create a clone of a secondary mirror before resynchronizing the mirror to the primary. This allows you greater protection with minimal performance impact should anything occur during the resynchronization, such as a data corruption, or the primary fails during the resynchronization, leaving the secondary in an unusable state. You can also create a clone of a mirror and back up the clone, which again offers less of a performance impact than backing up snapshots.

We recommend that you take a clone or a snapshot of a remote image only if the image's state is either synchronized or consistent (meaning that the last update that was started has completed successfully). If the image is synchronizing or out-of-sync, the clone or snapshot data will not be useful because the image was fractured or the update is still in progress.

Note:

If the clone's source is a MirrorView secondary image, the MirrorView driver prevents host I/O to the secondary image and reverse synchronization of an unfractured secondary image.

Using SnapView with SAN Copy

You can use SnapView with SAN Copy™ software to create a clone of the destination LUN. You can add the clone to the secondary server storage group rather than the SAN Copy destination. This allows the SAN Copy destination to maintain consistency with its source, and be available on an ongoing basis for incremental updates.

Note: SAN Copy tracks server writes to the SAN Copy source LUN (from the production server). SAN Copy does not track server writes to the SAN Copy destination LUN (from the secondary server), so you must fracture all clones of a SAN Copy destination LUN before you start the SAN Copy session. You can then synchronize the clones once the SAN Copy session completes.

SnapView servers

SnapView requires at least two servers : one server (called the production server) contains the LUN you want to copy, and another server (called the secondary server) lets you view the clone or snapshot. You can have multiple secondary servers.

Important: If you have a Windows server, or if you are managing a system with Navisphere Express, you must have at least two servers to use the SnapView.

The production server:

- Runs the customer applications
- Owns the source LUN

The secondary server (or any other server):

- Owns the clone or snapshot
- Reads from and writes to the fractured clone or activated snapshot
- Performs secondary tasks using the clone or snapshot or an independent analysis (such as, backup, decision support, or revision testing)

Note: You can configure a clustered server to access a source LUN, but not both the source LUN and its clone or snapshot. Only a server outside the cluster can access the clone or snapshot.

Figure 23 on page 984 shows a sample SnapView environment with two servers creating clones and snapshots of two database files and their logs.

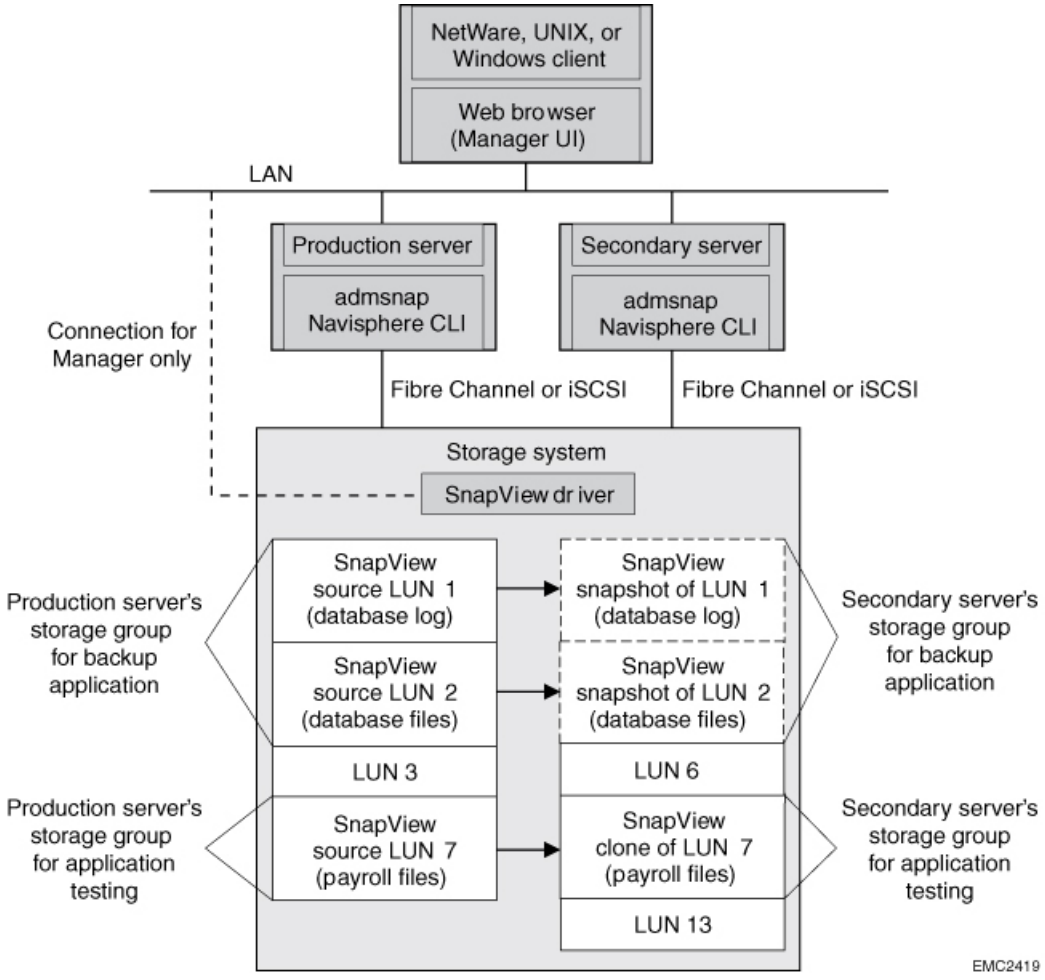


Figure 23. Sample SnapView environment with clones and snapshots

SnapView limits

This section lists the maximum SnapView limits for yoursystem.

Note: A metaLUN is a single entity, and therefore it counts as one of your clone or snapshot limits. For example, if a metaLUN is composed of five LUNs and you create a clone of this LUN, it counts as one of your clone limits, not five. SnapView also supports the new, larger LUNs that FLARE software supports (refer to the FLARE release notes).

Table 25. AX4-5 series systems with Navisphere

Parameter	AX4-5 series	
	Without the SnapView enabler installed	With the SnapView enabler installed
SnapView clones		
Clones		
Per system	Not supported	128
Per source LUN		8
Clone groups		
Per system	Not supported	64
Clone private LUNs		
Per system (required)	Not supported	2
Source LUNs		
Per system	Not supported	64
SnapView snapshots		
Snapshots		
Per system	16	256
Per source LUN	1	8
SnapView sessions[a]		
Per source LUN	1	8
Reserved LUNs		

[a] The limits for snapshots and sessions include SnapView snapshots or SnapView sessions as well as reserved snapshots or reserved sessions used in other applications, such as SAN Copy (incremental sessions) and MirrorView/Asynchronous applications.

Per system	64	64
Source LUNs		
Per system	16	64

Table 26. AX series systems with Navisphere

Parameter	AX150 series	AX100 series
SnapView snapshots		
Snapshots		
Per system	8	4
Per source LUN	1	1
SnapView sessions[a]		
Per source LUN	1	1
Reserved LUNs		
Per system	40	20
Source LUNs		
Per system	40	20

Note: Clones are *not* supported on AX150 or AX100 series systems.

Table 27. CX4 series systems

Parameter	CX4-120	CX4-240	CX4-480	CX4-960
Snapview clones				
Clones				
Per system	256[a]	512[a]	1024[a]	2048
Per source LUN	8	8	8	8
Clones in a consistent fracture				
Per source LUN	32	32	64	64

[a] The limits for snapshots and sessions include SnapView snapshots or SnapView sessions as well as reserved snapshots or reserved sessions used in other applications, such as SAN Copy (incremental sessions) and MirrorView/Asynchronous applications.

[a] The source LUN and MirrorView/Synchronous primary and secondary images no longer count towards the clone image limit.

Clone groups				
Per system	128	256	512	1024
Clone private LUNs				
Per system (required)	2	2	2	2
Source LUNs				
Per system	128	256	512	1024
Snapview snapshots				
Snapshots				
Per system	512	512	1024	2048
Per source LUN	8	8	8	8
Snapshots in a consistent start				
Per source LUN	32	32	64	64
SnapView sessions[b]				
Per source LUN	8	8	8	8
Reserved LUNs				
Per system	256	256	512	512
Source LUNs				
Per system	256	256	512	512

Table 28. CX3 series systems

Parameter	CX3 series model 10	CX3 series model 20	CX3 series model 40	CX3 series model 80
SnapView clones				
Clones				
Per system	128	256[a]	512[a]	1024[a]
Per source LUN	8	8	8	8
Clone groups				
Per system	64	128	256	512

[b] The limits for snapshots and sessions include SnapView snapshots or SnapView sessions as well as reserved snapshots or reserved sessions used in other applications, such as SAN Copy (incremental sessions) and MirrorView/Asynchronous applications.

[a] The source LUN and MirrorView/Synchronous primary and secondary images no longer count towards the clone image limit.

Clone private LUNs				
Per system (required)	2	2	2	2
Source LUNs				
Per system	64	128	256	512
SnapView snapshots				
Snapshots				
Per system	256	512	1024	2048
Per source LUN	8	8	8	8
SnapView sessions[b]				
Per source LUN	8	8	8	8
Reserved LUNs				
Per system	64	128	256	512
Source LUNs				
Per system	64	128	256	512

Table 29. CX series systems

Parameter	CX300 series	CX500 series	CX700
SnapView clones			
Clones			
Per system	100[a]	100[a]	200[a]
Per source LUN	8	8	8
Clone groups			
Per system	50	50	100
Clone private LUNs			
Per system (required)	2	2	2
Source LUNs			
Per system	50	50	100

[b] The limits for snapshots and sessions include SnapView snapshots or SnapView sessions as well as reserved snapshots or reserved sessions used in other applications, such as SAN Copy (incremental sessions) and MirrorView/Asynchronous applications.

[a] The source LUN and MirrorView/Synchronous primary and secondary images no longer count towards the clone image limit.

SnapView snapshots			
Snapshots[b]			
Per system	100	150	300
Per source LUN	8	8	8
SnapView sessions[b]			
Per source LUN	8	8	8
Reserved LUNs			
Per system	25	50	100
Source LUNs			
Per system	25	50	100

[b] The limits for snapshots and sessions include SnapView snapshots or SnapView sessions as well as reserved snapshots or reserved sessions used in other aplications, such as SAN Copy (incremental sessions) and MirrorView/Asynchronous applications.

SnapView Clone CLI commands

This section explains the Navisphere SnapView clone CLI commands that manage SnapView clones. The clone feature is supported only on CX4 series, CX3 series, CX series, and AX4-5 series with Navisphere Manager/Unisphere enabler and the SnapView enabler installed.

Note: If you currently use Java CLI to issue CLI commands, please note that Secure CLI is replacing Java CLI. Therefore, only Secure CLI will support new features. We recommend that you use Secure CLI. Secure CLI is also faster and more secure than Java CLI. Refer to the *EMC SnapView Command Line Interfaces (CLI)* for Java CLI support.

Setting up SnapView to use clones

This section describes how to set up SnapView to use clones.

Note: You cannot expand the capacity of a LUN that is participating in a clone group until you remove the clone from the clone group and destroy the clone group. Neither the production nor secondary server can access this added capacity until the expansion is complete and you perform some additional operations. For detailed information on expanding a LUN, see the *EMC Navisphere Command Line Interface (CLI) Reference*.

Prerequisites for setting up clones

Before you can set up and use clones, the following must be true:

- Source LUNs must be bound. For a client or production server to access a source LUN, you must assign the source LUN to a storage group and connect the storage group to the production server. To do this, you must enable data access control on the storage system.
- LUNs that you plan to use as clone LUNs must be bound. These LUNs must be the same size as the source LUNs that you will clone. EMC strongly recommends that you bind your clone LUNs on storage pools (RAID groups or thin pools) that are different from their source LUNs. The clone's storage pool does not have to be the same RAID type as the source LUN.
- For VMware ESX Servers, verify that the source LUN is presented to the virtual machine (guest operating system running on the virtual machine). For information on how to present a LUN to the virtual machine, refer to the VMware documentation that shipped with your ESX Server.
- For configuration restrictions when using VMFS volumes, go to the EMC E-Lab™ Interoperability Navigator on EMC Powerlink and under the PDFs and Guides tab, open the VMware ESX server.pdf file.

- For a secondary server to access the clone LUN, the clone must be assigned to a storage group (but you cannot read the clone until you fracture it). The storage group must be connected to the secondary server that will access the clone. You must assign the clone LUN to a storage group other than the storage group that holds the source LUN. EMC supports placing a clone in the same storage group as its source LUN only if you use Replication Manager or Replication Manager/SE to put the clone in the storage group. This software provides the same host access to the clone and the source LUN. For information on using these software products, refer to the documentation for the product.

  If you have a VMware ESX Server, the clone and source LUNs must be accessed by different virtual machines, unless the virtual machine is running one of the software programs that support same host access.

Overview of setting up SnapView to use clones

The following is a checklist for setting up SnapView clones:

- Allocate clone private LUNs; see clone | snapview -allocatecpl on page 1000.

  Note: This step is required only in the initial setup of clones.

- Create a clone group; see clone | snapview -createclonegroup on page 1009.
- Add a clone to a clone group; see clone | snapview -addclone on page 997.

Clone states

Each clone in a clone group has its own state that indicates if it contains usable data. The possible clone states are: consistent, out-of-sync, remote mirror synchronizing, reverse out-of-sync, reverse synchronizing, synchronized, or synchronizing. Depending on the state of the clone, some operations may be unavailable (refer to Table 30 on page 992).

When you remove a clone from the clone group, it is no longer associated with its source LUN or clone group. It retains the copied data and becomes a conventional (regular) LUN.

Note: Table 30 on page 992 lists when the clone is available for server I/O. The source LUN specified when creating a clone group is available for server I/O during any clone state except for a reverse out-of-sync state. If the clone's source is a MirrorView secondary image, the MirrorView driver prevents host I/O to the source. Any server writes made to the source LUN during reverse synchronization are copied to the clone. If you do not want incoming source writes copied to the clone during a reverse synchronization, you must issue the **`-UseProtectedRestore 1`** switch with the **`clone | snapview -addclone`** command before issuing a reverse synchronization. However, before you can initiate the Protected Restore feature, you must globally enable it by issuing the **`clone | snapview -changeclonefeature [-AllowProtectedRestore 1]`** command. You cannot perform a reverse synchronization if the clone's source is a MirrorView secondary image.

Table 30. Clone states

Clone state	Description	Cause of state	Clone available for I/O	What next?	
				Permitted operations	New clone state
Consistent	If the clone is unfractured, its data reflects some point-in-time copy of its source. If the clone is fractured, its data reflects some point-in-time copy of its source, modified by any host writes to the clone.	◆ A clone is fractured while in a consistent or synchronized state. ◆ A clone finishes synchronizing or reverse-synchronizing. ◆ An unfractured clone is in the synchronized state, and its source receives a host write. ◆ A clone is in the remote mirror synchronizing state, and its source (a MirrorView secondary image) transitions to the consistent state.	Yes, if clone is fractured	Fracture (only if clone is not already fractured)	Consistent; administratively fractured
				Remove (only if the clone is fractured)	N/A
				Synchronize (only if clone is fractured)	Synchronizing
				Reverse synchronize (only if clone is fractured and clone's source is not a MirrorView secondary image)	Reverse synchronizing
Out-of-sync	A clone is not a point-in-time copy of its source and is unusable.	◆ A clone was fractured while synchronizing. ◆ A clone was fractured while in the remote mirror synchronizing state.	No	Synchronize	Synchronizing
				Remove	N/A
				Fracture (only if the clone was fractured by the system due to an error in the software or system; refer to the event log for the cause of the system fracture)	Out-of-sync; administratively fractured
Remote mirror synchronizing	A clone is not a usable point-in-time copy because its source (a MirrorView secondary image) is in the synchronizing or out-of-sync state or may be in the process of a rollback.	An unfractured clone's source is a remote mirror secondary that begins synchronizing with the MirrorView primary image.	No	Fracture	Out-of-sync

Table 30. Clone states *(continued)*

Clone state	Description	Cause of state	Clone available for I/O	What next?	
				Permitted operations	New clone state
Reverse out-of-sync	A clone's source is unusable and another reverse sync operation is recommended.	A clone was fractured while reverse-synchronizing.	Yes	Reverse synchronize	Reverse synchronizing
				Remove	N/A
				Fracture (only if the clone was fractured by the system due to an error in the software or system; refer to the event log for the cause of the system fracture)	Reverse out-of-sync; administratively fractured
Reverse synchronizing	A clone is in the process of copying its data to its source LUN.	◆ Manually administered with Unisphere or the CLI from the production server. ◆ Automatically restarted following an SP failure only if a reverse synchronization was in progress during the SP failure and the recovery policy was set to Auto. Note: Before you can reverse synchronize a clone, you must fracture it. Also, the clone cannot be in an out-of-sync state, and no other clone in the clone group can be synchronizing or reverse synchronizing.	No	Fracture	Reverse out-of-sync

Table 30. Clone states *(continued)*

Clone state	Description	Cause of state	Clone available for I/O	What next?	
				Permitted operations	New clone state
Synchro-nized	A clone is a byte-for-byte copy of its source. Note: The clone will immediately transition to the consistent or remote mirror synchronizing state if the source receives a write.	◆ After a synchro-nization, reverse synchronization, or a server write request, an un-fractured clone automatically transitions to this state when the source LUN does not receive any server write requests during a specified peri-od of time, which is defined by the Clone Groups Quiesce Thresh-old. ◆ A clone is added to a clone group without setting "Initial Sync Re-quired".	No	Fracture	Consistent
				Remove	N/A

Table 30. Clone states *(continued)*

Clone state	Description	Cause of state	Clone available for I/O	What next?	
				Permitted operations	New clone state
Synchronizing	A clone is in the process of copying data from its source LUN.	◆ Manually administered through Unisphere by the production server. ◆ Automatically started when you add a clone to a clone group with the Initial Sync Required property selected. ◆ Automatically restarted following an SP failure (if a synchronization was in progress during an SP failure and the recovery policy was set to Auto). Note: Before you can manually synchronize a clone, you must fracture the clone, and the clone cannot be in a reverse out-of-sync state.	No	Fracture	Out-of-sync

CLI clone command functions

The naviseccli clone functions, listed alphabetically, are:

Note: As of version 6.26, you can issue clone commands using the clone or snapview prefix.

- clone | snapview -addclone

- clone | snapview -allocatecpl
- clone | snapview -changeclone
- clone | snapview -changeclonefeature
- clone | snapview -changeclonegroup
- clone | snapview -consistentfractureclones
- clone | snapview -createclonegroup
- clone | snapview -deallocatecpl
- clone | snapview -destroyclonegroup
- clone | snapview -fractureclone
- clone | snapview -listclone
- clone | snapview -listclonefeature
- clone | snapview -listclonegroup
- clone | snapview -removeclone
- clone | snapview -reversesyncclone
- clone | snapview -syncclone

The CLI clone functions are listed functionally, in the order you would perform them, in the following table.

Table 31. naviseccli SnapView clone command functions, listed in order of use

Essential functions (in order performed)	
clone | snapview -allocatecpl	Designates clone private LUNs.
clone | snapview -createclonegroup	Creates a clone group.
clone | snapview -addclone	Adds a clone LUN to the clone group.
clone | snapview -syncclone	Starts synchronizing the clone with the source LUN.
clone | snapview -consistentfractureclones or clone | snapview -fractureclone	Frees the clone LUN(s) from its source, allowing you to use the clone independently.
clone | snapview -removeclone	Deletes a clone from a clone group.
clone | snapview -destroyclonegroup	Deletes a clone group.
Optional and status functions (alphabetically)	
clone | snapview -listclone	Displays clone information.

clone | snapview -listclonefeature	Displays clone features such as whether creating a clone group on this system is supported and other useful information.
clone | snapview -listclonegroup	Displays clone group information.
Optional reconfiguration functions (alphabetically)	
clone | snapview -changeclone	Changes one or more properties of a clone.
clone | snapview -changeclonefeature	For a system, enables or disables clone features such as protected restore.
clone | snapview -changeclonegroup	Changes clone group settings.
clone | snapview -deallocatecpl	Frees LUNs that were allocated as clone private LUNs from the system clone structure.
clone | snapview -reversesyncclone	Starts a reverse sync process, in which the software copies the clone data to the source.

clone | snapview -addclone

Adds a clone to a clone group.

PREREQUISITES

You must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **naviseccli clone** or the **naviseccli snapview** command with **-addclone** adds a clone to a clone group. Each clone LUN you add must be the same size as the source LUN. When you add a clone to a clone group, you create an actual copy of the source LUN you specified when creating the group. The copy of the source LUN begins when you specify the **-issyncrequired** 1 command when adding the clone LUN. This command is also used to add an initializing thin LUN as a clone target, provided the bundle containing the thin LUN support is committed in all the systems.

The software assigns each clone a clone ID. This ID remains with the clone until you remove the clone from its group.

Note: When you add a clone to a clone group, SnapView automatically allocates and retains additional memory. This additional memory counts against the total replication software memory budget.

Source LUN writes and unfractured clone states — While the clone is part of the clone group and unfractured (not accessible to a secondary server), server writes to the source LUN can continue, with the following results:

Server writes to the source — When a source LUN receives a server write request, the clone transitions into a consistent state because the clone is no longer a byte-for-byte copy of its source. Writes made to the source LUN are simultaneously copied to the clone. The clone remains in a consistent state if server writes are made to the source LUN during the duration of the quiesce threshold. The quiesce threshold is the amount of time the clone must wait before transitioning from a consistent state to a synchronized state. If the source LUN receives any server writes during this period of time, the time set for the quiesce threshold restarts. You specify the quiesce threshold when you create a clone group.

Note: When you add a clone to the clone group, with the **Initial Sync Required** property selected, the clone state is synchronizing. The software transitions the clone to synchronized or consistent state only after the initial synchronization is complete.

No server writes to the source — If a source LUN does not receive any server writes for the duration of the quiesce threshold, any unfractured clone in a consistent state transitions into a synchronized state.

Note: See Clone states on page 991 for information about the state of a clone.

SYNTAX

```
clone | snapview -addclone -name name|-CloneGroupUid uid -luns lun_numbers
[-issyncrequired 0|1]
[-RecoveryPolicy manual|auto]
[-SyncRate high|medium|low|value]
[-UseProtectedRestore 0|1]
```

OPTIONS

-name *name*

Specifies the name that you gave to the clone group with the **-createclonegroup** function. Use either this name or the clone group unique ID (16-byte WWN).

-CloneGroupUid *uid*

Specifies the 16-byte unique ID the software assigned when the clone group was created. The clone group ID consists of the numbers 0 through 9 and the letters A through F (these letters are not case sensitive). You can use the **-listclonegroup** command function to obtain the clone group ID (refer to clone | snapview -listclonegroup on page 1022 for more information).

-luns *lun_numbers*

Specifies the LUN numbers that can serve as clones. Currently only one LUN is supported per command.

-issyncrequired 0|1

Specifies whether the software must synchronize the newly added clone.

0 - Synchronization is not required. Using this value lets you skip the synchronization period if the source LUN contains null data (as with a newly bound source LUN).

CAUTION When you specify **issyncrequired 0**, the software marks the clone as synchronized regardless of its contents. Therefore, do not specify **issyncrequired 0** if the source LUN contains any data, because the clone will appear as synchronized when it is not synchronized, and will probably not contain usable data.

1 - Synchronization is required (default). The software starts synchronizing the clone immediately.

-RecoveryPolicy manual|auto

Specifies the synchronization action the system will take after a hardware component (such as an SP) fails. Values are:

- manual - Manual recovery. The administrator must act to start synchronization.
- auto - Automatic. Synchronization will start automatically using the other path (if available). This is the default.

The value you select also applies if reverse-synchronization was in progress before the failure.

-SyncRate high|medium|low|value

Sets the interval between writes to a clone being synchronized to high, medium, or low, or a value in milliseconds. Default is **medium**. A high rate synchronizes the clone the fastest, but may affect performance on other system resources. A low value has minimal effect on performance, but prolongs the synchronization process.

Note: EMC recommends that you do not use a high synchronization rate on a system with a single SP.

- UseProtectedRestore 0|1

Determines the way the software reacts when I/O is received during a reverse sync operation.

0 - Updates the clone with the incoming server I/O. This is the default.

1 - Does not update the clone with the I/O.

EXAMPLE

This example adds the current logged-in user to the security file. Once you enter this command, you do not have to re-enter your username, password, or scope in the command line.

```
naviseccli -password password -scope 0 -addusersecurity

naviseccli -address ss1_spa clone -allocatecpl -spA 54 -spB 55

naviseccli -address ss1_spa clone -createclonegroup -name db3_clone -luns
22

naviseccli -address ss1_spa clone -addclone -name db3_clone -luns 43 -o

naviseccli -address ss1_spa clone -listclonegroup

Name: db3_clone

CloneGroupUid:  50:06:01:60:20:04:21:3E:0C:00:00:00:00:00:00:00

InSync: No
```

These commands allocate clone private LUNs (LUNs 54 and 55), create a clone group named **db3_clone** for source LUN 22, add a clone LUN (LUN 43) to the group, and then list clone groups. Synchronization starts by default with the **-addclone** command since that command does not specify **-issyncrequired** 0. To remove the logged in user from the security file, issue the following last command:

```
naviseccli -removeusersecurity
```

OUTPUT

None if the command succeeds; status or error information if it fails.

clone | snapview -allocatecpl

Reserves a clone private LUN for use with clones.

PREREQUISITES

You must have a user account on the system on which you want the command executed.

Each clone private LUN must be a minimum of 1 gigabyte. Clone private LUNs larger than 1 gigabyte provide no performance benefit. You must bind these LUNs before you allocate them as a clone private LUN. You can use any LUN that is at least 1 gigabyte in size as a clone private LUN, except for the following:

- Thin LUNs

- Hot spare LUNs
- MirrorView remote mirror LUNs (LUNs used as either a primary or secondary image)
- SnapView clone, snapshot, or source LUNs
- SAN Copy source or destination logical units
- Private LUNs (LUNs reserved as clone private LUNs or for use by the reserved LUN pool)

You should bind clone private LUNs in a RAID group that normally does not see heavy I/O.

DESCRIPTION

The **naviseccli clone** or the **naviseccli snapview** command with **-allocatecpl** allocates or reallocates a clone private LUN on both SPs for clone operations. You must allocate one clone private LUN for each SP before you can create a clone group. This command supports thin LUNs, provided the bundle containing the thin support is committed in all the systems.

If you use **-allocatecpl** to reallocate (change an existing allocation) clone private LUN, you must change the clone private LUN for both SPs. When you reallocate the clone private LUNs, the software transfers the information stored in the previous clone private LUNs to the new clone private LUNs.

Note: When you allocate clone private LUNs, SnapView automatically allocates and retains additional memory. This additional memory counts against the total replication software memory budget.

SYNTAX

clone | snapview -allocatecpl -spA *lun_number* **-spB** *lun_number* **-o**

OPTIONS

-spA *lun_number*

lun-number identifies the LUN to be used for the clone private LUN for SP A. The LUN must be bound. You must specify a clone private LUN for both SP A and SP B. However, the ownership of these LUNs does not matter, since the software will trespass each LUN you specify in each **-sp** switch to the specified SP.

-spB *lun_number*

lun_number identifies the LUN to be used for the clone private LUN for SP B. The LUN must be bound. See comments under **-spA**.

-o

Executes the command without prompting for confirmation.

EXAMPLE

This example allocates a clone private LUN to SP A (the LUN with LUN ID 54) and SP B (LUN with ID 55) for clone operations (see also the **-addclone** example earlier):

```
naviseccli -address ss1_spa clone -allocatecpl -spA 54 -spB 55 -o
```

OUTPUT

None if the command succeeds; status or error information if it fails.

clone | snapview -changeclone

Changes one or more properties of a clone. **clone -changeclone** or **snapview -changeclone** is used with naviseccli as follows.

PREREQUISITES

You must have a user account on the system on which you want the command executed.

DESCRIPTION

The **naviseccli clone** or the **naviseccli snapview** command with **-changeclone** changes one or more clone properties. The clone can be in any state when you use this function. If you omit the override option (**-o**), the software displays a message to confirm the change.

SYNTAX

```
clone | snapview -changeclone -name name|-CloneGroupUid uid -cloneid id
[-RecoveryPolicy manual|auto]
[-SyncRate high|medium|low|value]
[-UseProtectedRestore 0|1]
[-o]
```

OPTIONS

-name *name*

Specifies the name that you gave to the clone group with the **-createclonegroup** function. Use either this name or the clone group unique ID (16-byte WWN).

-CloneGroupUid *uid*

Specifies the 16-byte unique ID the software assigned when the clone group was created. The clone group ID consists of the numbers 0 through 9 and the letters A through F (these letters are not case sensitive). You can use the **-listclonegroup** command function to obtain the clone group ID.

-cloneid *id*

Specifies the 16-character clone ID the system assigned when the clone was added. You can obtain this using the **-listclonegroup** command function. The id is numeric.

-RecoveryPolicy *manual*|*auto*

Specifies the synchronization action the system will take after a hardware component (such as an SP) fails. Values are:

- manual - Manual recovery. The administrator must act to start synchronization.
- auto - Automatic. Synchronization will start automatically using the other path (if available). This is the default.

The value you select also applies if reverse-synchronization was in progress before the failure.

-SyncRate *high*|*medium*|*low*|*value*

Sets the interval between writes to a clone being synchronized to high, medium, or low, or a value in milliseconds. Default is medium. A high rate synchronizes the clone fastest, but may degrade overall performance. A low value has minimal effect on performance, but prolongs the synchronization process.

Note: EMC recommends that you do not use a high synchronization rate on a CX400 system.

-UseProtectedRestore 0|1

Specifies the way the software will react when I/O is received during a reverse sync operation.

0 - Updates the clone with the I/O. Default.

1 - Does not update the clone with I/O.

This property is available only if the option is supported on the targeted system.

Note: When you change the property for the **-UseProtectedRestore** option, SnapView automatically allocates and retains additional memory. This additional memory counts against the total replication software memory budget.

-o

Executes the command without prompting for confirmation.

EXAMPLE

This command changes the sync rate for the clone **0100000000000000** in clone group **db3_clone**.

```
naviseccli -address ss1_spa clone -changeclone -name db3_clone -cloneid
0100000000000000 -syncrate high -o
```

OUTPUT

None if the command succeeds; status or error information if it fails.

clone | snapview -changeclonefeature

Enables or disables clone features such as protected restore.

PREREQUISITES

You must have a user account on the system on which you want the command executed.

DESCRIPTION

The **naviseccli clone** or the **naviseccli snapview** command with **-changeclonefeature** can globally enable or disable the **-AllowProtectedRestore** option. This option allows you to use the protected restore feature on a per clone basis. For information on the protected restore feature, refer to clone | snapview -reversesyncclone on page 1028.

If you omit the override option (**-o**), the software displays a message to confirm the change.

SYNTAX

```
clone | snapview -changeclonefeature [-AllowProtectedRestore 0|1]
[-o]
```

OPTIONS

-AllowProtectedRestore 0|1

Enables or disables the ability to use protected restores on LUNs in a system. Be aware that enabling protected restores reserves SP memory and prevents it from being used for any other purpose.

0-Does not allow protected restores on this system. Default.

1-Allows protected restores on this system.

Note: When you enable the **-AllowProtectedRestore** option, SnapView automatically allocates and retains additional memory. This additional memory counts against the total replication software memory budget.

-o

Executes the command without prompting for confirmation.

EXAMPLE

This example allows protected restores on the system that contains the SP **ss1_spa**.

```
naviseccli -address ss1_spa clone -changeclonefeature -AllowProtectedRestore
 1

Do you really want to perform this operation?

y
```

OUTPUT

None if the command succeeds; status or error information if it fails.

clone | snapview -changeclonegroup

Changes one or more parameters of an existing clone group.

PREREQUISITES

You must have a user account on the system on which you want the command executed.

DESCRIPTION

The **naviseccli clone** or the **naviseccli snapview** command with **-changeclonegroup** can change certain settings of an existing clone group.

SYNTAX

clone | snapview -changeclonegroup -name *name*|**-CloneGroupUid** *uid* [**-description** *description*]
[**-newname** *name*]
[**-o**]

[**-quiescethreshold** *seconds*]

OPTIONS

-name *name*

Identifies the clone group. Use the name assigned when the clone group was created with **-createclonegroup**. To identify a clone group, you can use either the clone name or the clone group unique ID.

-CloneGroupUid *uid*

Specifies the 16-byte unique ID the software assigned when the clone group was created. The clone group ID consists of the numbers 0 through 9 and the letters A through F (these letters are not case sensitive). You can use the **-listclonegroup** command function to obtain the clone group ID.

-description *description*

Lets you enter a description about the clone group—up to 256 characters. If you want to include any spaces, enclose the entire description in double quotation marks. The quotation marks do not count towards the 256-character limit.

-newname *name*

Lets you specify a new name for the clone group. A valid name consists of at least one printable character and must not exceed 64 characters. Each clone group name must be unique on its system.

-o

Executes the command without prompting for confirmation.

-quiescethreshold *seconds*

Lets you specify the amount of time that must pass after an I/O to the source LUN before the software places any of its unfractured clones in the synchronized state. The minimum value is 10, the maximum value is 3600.

EXAMPLE

This example changes the quiesce threshold for clone group **db3_clone** to **30** seconds.

```
naviseccli -address ss1_spa clone -changeclonegroup -name db3_clone
-quiescethreshold 30

Do you really want to perform this operation?

y
```

OUTPUT

None if the command succeeds; status or error information if it fails.

clone - snapview -consistentfractureclones

Splits a set of clones from their source LUNs.

PREREQUISITES

You must have a user account on the system on which you want the command executed.

The clones you want to fracture must be within different clone groups. You cannot perform a consistent fracture on clones belonging to different systems. You must specify two or more clones that you want to fracture or an error will be displayed.

DESCRIPTION

The **naviseccli clone** or the **naviseccli snapview** command with **-consistentfractureclones** fractures more than one clone at the same time in order to preserve the point-in-time restartable copy across the set of clones. The SnapView driver will delay any I/O requests to the source LUNs of the selected clones until the fracture has completed on all clones (thus preserving the point-in-time restartable copy on the entire set of clones).

Note: A restartable copy is a data state having dependent write consistency and where all internal database/application control information is consistent with a database management system/application image.

After the consistent fracture completes, no group association exists between the clones. If a failure occurs on any of the clones, the consistent fracture will fail on all of the clones. If any clones within the group were fractured prior to the failure, the software will resynchronize those clones. For more information on the effects of fracturing a clone, refer to the **-fractureclone** description in clone | snapview -fractureclone on page 1013.

SYNTAX

clone | snapview -consistentfractureclones -CloneGroupNameCloneId *name cloneId*|**-CloneGroupUidCloneId** *CGUid cloneId* [**-o**]

OPTIONS

-CloneGroupNameCloneId *name cloneId*

Lets you specify the clone group name and the clone ID for the clones you want to fracture. If you specify the clone group name and clone ID for one clone, you must specify the same information for all the other clones you want to fracture at the same time.

The clone group name is the name you specified when you created the clone group. The clone ID is the 16-character ID. The system assigned when the clone was added to the clone group. The clone ID is always numeric.

Use the **-listclonegroup** command to display all the clone group names and clone IDs on the system (see clone | snapview -listclonegroup on page 1022).

-CloneGroupUidCloneId *CGUid cloneId*

Lets you specify the clone group ID and the clone ID for the clones you want to fracture. If you specify the clone group ID and clone ID for one clone, you must specify the same information for all the other clones you want to fracture at the same time.

The clone group ID is the 16-byte unique ID the software assigned when you created the clone group. The clone group ID consists of the numbers 0 through 9 and the letters A through F (these letters are not case sensitive). The clone ID is the 16-character ID the system assigned when the clone was added to the clone group. The clone ID is always numeric.

Use the **-listclonegroup** command to display all the clone group IDs and clone IDs on the system (see clone | snapview -listclonegroup on page 1022).

-o

Executes the command without prompting for confirmation.

EXAMPLE

```
naviseccli -address ss1_spa clone -consistentfractureclones
-CloneGroupNameCloneId CGname1 0100000000000000 CGname2 0200000000000000
CGname3 0300000000000000 -o
```

or

```
naviseccli -address ss1_spa snapview -consistentfractureclones
-CloneGroupUidCloneId 50:06:01:60:80:60:03:E5:3A:00:00:00:00:00:00:00
0100000000000000 50:06:01:60:80:60:03:E5:3A:00:00:00:00:00:00:00
0200000000000000 50:06:01:60:80:60:03:E5:3A:00:00:00:00:00:00:00
0300000000000000 -o
```

OUTPUT

None if the command succeeds; status or error information if it fails.

clone | snapview -createclonegroup

Creates a new clone group based on a source LUN.

PREREQUISITES

You must have a user account on the system on which you want the command executed.

You must have allocated a clone private LUN for each SP.

Any source LUN that is at least 1 GB in size is eligible to be cloned, except for the following:

- Hot spare LUNs
- Clone LUNs (LUNs participating in any clone group as either a source LUN or a clone LUN)
- Snapshot LUNs
- MetaLUNs
- Private LUNs (LUNs reserved as clone private LUNs, in a reserved LUN pool, or in a write intent log)
- A LUN in the process of a migration

Note: With SnapView version 6.24 or later, a clone's source LUN can be a remote mirror LUN (a LUN participating as either a primary or secondary image).

DESCRIPTION

The **naviseccli clone** or the **naviseccli snapview** command with **-createclonegroup** creates a new clone group using an existing LUN as a source.

Note: When you create a clone group, SnapView automatically allocates and retains additional memory. This additional memory counts against the total replication software memory budget.

SYNTAX

clone | snapview -createclonegroup -name *name* **-luns** *lun_number* [**-description** *description*]
[**-quiescethreshold** *seconds*][**-o**]

OPTIONS

-name *name*

Lets you specify the name of the clone group. A valid name consists of at least one printable character and must not exceed 64 characters. Each clone group name must be unique on its system.

-luns *lun_number*

The *lun_number* identifies the source LUN of the clone group.

-description *description*

Lets you enter a description about the clone group—up to 256 characters. If you want to include any spaces, enclose all text with double quotation marks.

-quiescethreshold *seconds*

Lets you specify the amount of time that must pass after an I/O to the source LUN before the software places any of its unfractured clones in the synchronized state. The minimum value is 10, the maximum value is 3600.

-o

Executes the command without prompting for confirmation.

EXAMPLE

This command creates a clone group named **db3_clone** for source LUN **22**. Refer to the example for **-addclone**, clone | snapview -addclone on page 997.

```
naviseccli -address ss1_spa clone -createclonegroup -name db3_clone -luns
22 -o
```

OUTPUT

None if the command succeeds; status or error information if it fails.

POSTREQUISITES

You will need to add a clone using the **clone | snapview -addclone** command and synchronize the clone before you can fracture and use it.

You can use the **-changeclonegroup** function to change some of the create parameters.

clone | snapview -deallocatecpl

Deallocates the clone private LUNs.

PREREQUISITES

You must have a user account on the system on which you want the command executed.

You must remove all clones and destroy any clone groups before deallocating the clone private LUNs. You must also globally disable the Allow Protected Restore option. To do this, issue the clone | snapview -changeclonefeature **-AllowProtectedRestore 0** command (refer to clone | snapview -changeclonefeature on page 1004 for more information on this command).

DESCRIPTION

The **naviseccli clone** or the **naviseccli snapview** command with **-deallocatecpl** removes the LUNs that were previously allocated as clone private LUNs. You can also use the **-deallocatecpl** command to reallocate clone private LUNs, for instance, if a clone private LUN fails or if you decide that you want to use a different LUN as your clone private LUN. If you use the **-deallocatecpl** command to reallocate the clone private LUNs, you can do so with existing clone groups and clones. When you reallocate the clone private LUN, the software transfers the information stored in the previous clone private LUN to the new clone private LUN.

Note: If you reallocate one clone private LUN, you must reallocate the other clone private LUN.

SYNTAX

```
clone | snapview -deallocatecpl [-o]
```

OPTIONS

-o

Tells the CLI to execute the command without waiting for confirmation.

EXAMPLE

```
naviseccli -address ss1_spa clone -deallocatecpl -o
```

OUTPUT

None if the command succeeds; status or error information if it fails.

clone | snapview -destroyclonegroup

Deletes a clone group.

PREREQUISITES

You must have a user account on the system on which you want the command executed.

Before you can destroy a clone group, you must remove all clones in the clone group.

DESCRIPTION

The **naviseccli clone** or the **naviseccli snapview** command with **-destroyclonegroup** permanently removes a clone group from the system and releases the source LUN specified when you created the clone group.

SYNTAX

clone | snapview -destroyclonegroup -name *name*|**-CloneGroupUid** *uid* [**-o**]

OPTIONS

-name *name*

Identifies the clone group. Use the name assigned when the clone group was created with **-createclonegroup**. To identify a clone group, you can use either the clone name or the clone group unique ID.

-CloneGroupUid *uid*

Specifies the 16-byte unique ID the software assigned when the clone group was created. The clone group ID consists of the numbers 0 through 9 and the letters A through F (these letters are not case sensitive). You can use the **-listclonegroup** command function to obtain the clone group ID (see clone | snapview -listclonegroup on page 1022).

-o

Tells the CLI to execute the command without waiting for confirmation.

EXAMPLE

```
naviseccli -address ss1_spa clone -destroyclonegroup -name db3_clone -o
```

OUTPUT

None if the command succeeds; status or error information if it fails.

clone | snapview -fractureclone

Splits a clone from its source LUN.

PREREQUISITES

You must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **naviseccli clone** or the **naviseccli snapview** command with **-fractureclone** splits a clone from its source LUN, allowing a secondary server to access the clone as an independent LUN.

Note: To fracture more than one clone at the same time, you must use the **-consistentfractureclones** command (see clone - snapview -consistentfractureclones on page 1007).

Fracturing a clone or a set of clones (**-consistentfracture**) does not remove the clone(s) from its clone group. It remains a part of the clone group — although other servers can access it as an independent LUN — until you explicitly remove it (**-removeclone**). While a clone remains in its clone group, you can synchronize it again using just the **-syncclone** function.

Note: Unless you have additional software that supports same host access, you must assign the clone LUN to a storage group other than the storage group that holds the source LUN(s). You also must assign multiple fractured clones, of the same source LUN(s), to different storage groups. See Prerequisites for setting up clones on page 990 for information on software that supports same host access.

Two types of fractures can occur - administrative or system.

An administrative fracture will occur after any of the following events:

- The production server performed a fracture operation on the clone or set of clones.
- The secondary server performed a reverse synchronization operation on another clone in the clone group.
- The clone driver receives an error reading or writing to the source or clone during a synchronization or reverse synchronization. Possible errors include a failed sector or a bad block.

Note: To verify if an error occurred, issue the **-listclonegroup** command and determine if the value for SourceMediaFailure or CloneMediaFailure is set to TRUE. If an error did occur, you must correct the failure, then re-issue the synchronization or reverse synchronization operation. If the error persists, contact your EMC service provider.

A system fracture will occur after any of the following events:

- The clone driver encountered an internal driver error and fractured the clone as a result. If this occurs, you must correct the error condition, perform a fracture (administrative fracture), and then synchronize the clone.
- The source LUN trespasses to the peer SP, either manually or due to an SP failure. If this occurs, the system fracture is temporary and the clone will automatically synchronize with its source LUN when the source trespasses back to its SP.
- Other replication software uses the clone or its source, for example, to start a SAN Copy session or to create a snapshot of the LUN. If this occurs, the system fracture is temporary and the clone will automatically synchronize with its source LUN after the event completes.

You can fracture a clone in any state. However, to make a fractured clone available for server write requests, you must fracture the clone while it is in a synchronized or consistent state. Once you fracture the clone in either of these states, it transitions to a consistent state.

If you want the clone to contain a predictable point-in-time copy, you must ensure that no server writes are occurring when you fracture the clone. You can determine that no writes have been issued to the source LUN for a period of time equal to the quiesce threshold if you fracture the clone while it is in a synchronized state. However, it does not guarantee that another server write will not occur around the same time you fracture the clone.

If the clone never enters the synchronized state, server writes are continuing. Any server writes to the source that occur after the fracture are not copied to the clone. If you believe you have stopped all I/O to the clone's source LUN, it may be difficult to determine the reason for those writes. For example, they can be due to heartbeats in some clustered systems.

In some cases it is useful to fracture the clone in a consistent state. For instance, you would fracture a clone in a consistent state when:

- you can determine that there are no writes being issued to the source LUN and you prefer not to wait for the quiesce threshold to elapse.
- your application has a hot backup mode in which the application continues to write to the source, but internally understands how to disregard writes generated after your specified point in time.
- you need only a crash consistent image (the image you would have if the server failed or shut down improperly).

If the clone synchronization is detracting from the system's performance, you can fracture the clone in any other state and then synchronize it at a time when performance is not an issue.

Writes to the fractured clone LUN

When a fractured clone receives a server write request, the software marks the clone as dirty, which indicates that the clone has been modified and is no longer a byte-for-byte copy of its source LUN.

Writes to the source LUN

After you fracture the clone, the software does not copy any server write requests made to the source LUN unless you manually perform a synchronization. Synchronizing a fractured clone unfractures the clone and updates the contents on the clone with its source LUN.

SYNTAX

clone | snapview -fractureclone -name *name*| **-CloneGroupUid** *uid* **-cloneid** *id* [**-o**]

OPTIONS

-name *name*

Identifies the clone group. Use the name assigned when the clone group was created with **-createclonegroup**. To identify a clone group, you can use either the clone name or the clone group unique ID.

-CloneGroupUid *uid*

Specifies the 16-byte unique ID the software assigned when the clone group was created. The clone group ID consists of the numbers 0 through 9 and the letters A through F (these letters are not case sensitive). You can use the **-listclonegroup** command to obtain the clone group ID (see clone | snapview -listclonegroup on page 1022).

-cloneid *id*

Specifies the 16-character clone ID the system assigned when the clone was added. You can obtain this using the **-listclonegroup** command function. The id is numeric.

-o

Tells the CLI to execute the command without waiting for confirmation.

EXAMPLE

```
naviseccli -address ss1_spa clone -fractureclone -name db3_clone -o
```

OUTPUT

None if the command succeeds; status or error information if it fails.

clone | snapview -listclone

Displays information about a specific clone LUN.

PREREQUISITES

You must have a user account on the system on which you want the command executed.

DESCRIPTION

The **naviseccli clone** or the **naviseccli snapview** command with **-listclone** displays information about one clone, not clone groups. You must specify the clone name or clone group ID. You can obtain more specific information with function switches.

SYNTAX

```
clone | snapview -listclone -Name name|-CloneGroupUid uid [-all]
[-AvailableForIO]
[-CloneCondition]
[-cloneid id]
[-CloneLuns]
[-CloneLunWWNs]
[-CloneState]
[-CloneMediaFailure]
[-IsDirty]
[-IsFractured]
[-PercentSynced]
[-RecoveryPolicy]
[-SyncRate]
[-timeoffracture]
[-UseProtectedRestore 0|1]
```

OPTIONS

-Name *name*

Specifies the name of the clone group. This is required for getting information on a clone.

-CloneGroupUid *uid*

Specifies the 16-byte unique ID the software assigned when the clone group was created. The clone group ID consists of the numbers 0 through 9 and the letters A through F (these letters are not case sensitive). You can use the **-listclonegroup** command function to obtain the clone group ID (see clone | snapview -listclonegroup on page 1022).

-all

Lists all the properties of a clone without having to type in any other switch. This switch must be specified to know the **-timeoffracture** of the clone.

-AvailableForIO

Displays whether the clone is available for I/O from an attached server (**yes** or **no**).

-CloneCondition

Displays the clone condition. Typically, this shows the nature of a faulted clone. The values include Administratively Fractured, System Fractured, Waiting on administrator to initiate synchronization, Queued to be synchronized, Synchronizing, Normal, Unknown.

Note: If you fractured a clone (**-fractureclone**) or a group of clones (**-consistentfractureclones**), the clone condition will be displayed as **Administratively Fractured**.

-cloneid *id*

Specifies the 16-character clone ID the system assigned when the clone was added. You can learn this using the **-listclonegroup** command function. The id is case sensitive.

-CloneLuns

Displays a list of clone LUN numbers.

-CloneLUNWWNs

Displays the WWN of the clone.

-CloneState

States are consistent, out-of-sync, remote mirror synchronizing, reverse-out-of-sync, reverse-synchronizing, synchronized or synchronizing.

-CloneMediaFailure

Indicates whether an error occurred during I/O with the clone LUN (**yes** or **no**).

-IsDirty

Indicates whether the clone received a server write request, which means it is not a byte-for-byte duplicate of its source LUN (**yes** or **no**).

-IsFractured

Indicates whether the clone was fractured (**yes** or **no**).

-PercentSynced

Displays the percentage of the clone that is synchronized with its source.

-RecoveryPolicy

Indicates the recovery policy (see **-addclone**), Automatic or Manual.

-SyncRate

Displays `high`,`medium`,`low` or a user-specified positive integer.

-timeoffracture

Displays the date/time when the clone images were administrative fractured.

-UseProtectedRestore 0|1

Indicates the state of the Protected Restore option. Values are **0** (clone may be updated with new I/O during a restore) or **1** (clone cannot be updated with new I/O during restore).

EXAMPLE # 1

```
naviseccli -address ss1_spa clone -listclone -name db3_clone

Name:  db3_clone

CloneGroupUid:  50:06:01:60:80:60:03:E5:3A:00:00:00:00:00:00:00

CloneID:  0100000000000000

CloneState:  Synchronized

CloneCondition:  Normal

AvailableForIO:  No

CloneMediaFailure:  No

IsDirty:  No

IsFractured:  No

PercentSynced:  100

RecoveryPolicy:  Auto

SyncRate:  Medium

CloneLUNs:  1

UseProtectedRestore:  No
```

EXAMPLE # 2

```
naviseccli -scope 0 snapview -listclone -name CG -timeoffracture

Name:  CG

CloneGroupUid:  50:06:01:60:BC:E0:1C:43:01:00:00:00:00:00:00:00

CloneID:  0200000000000000

TimeofFracture:  12/15/09 11:25:19
```

EXAMPLE # 3

```
naviseccli -scope 0 snapview -listclone -name CG -all

Name:  CG

CloneGroupUid:  50:06:01:60:BC:E0:1C:43:01:00:00:00:00:00:00:00

CloneID:  0200000000000000

CloneState:  Consistent

CloneCondition:  Administratively Fractured

AvailableForIO:  Yes

CloneMediaFailure:  No

IsDirty:  No

IsFractured:  Yes

PercentSynced:  N/A

RecoveryPolicy:  Auto

SyncRate:  Medium

CloneLUNs:  10

UseProtectedRestore:  No

TimeofFracture:  12/15/09 11:25:19
```

clone | snapview -listclonefeature

Displays general information for a system that supports clones.

PREREQUISITES

You must have a user account on the system on which you want the command executed.

DESCRIPTION

The **naviseccli clone** or the **naviseccli snapview** command with **-listclonefeature** and no other switches lists general clone information for a system that supports clones. You can obtain more specific information with switches.

SYNTAX

```
clone | snapview  -listclonefeature [-AllowProtectedRestore]
[-AvailableLUNs]
[-CanCreate]
[-Cpl]
[-CplSPA]
[-CplSPB]
[-DriverVersion]
[-MaxCloneGroupsUsingCPL]
[-MaxCloneMemory]
[-MaxClonesPerGroup]
[-MaxLUNsPerSource]
[-MinCplSize]
```

OPTIONS

-AllowProtectedRestore

Displays the state of the system Protected Restore option. The state can be **no**, which indicates that the system should update the clone with the I/O, or **yes**, which indicates that it should not update the clone with the I/O. This option is available only if it is supported on the targeted system.

-AvailableLUNs

Lists LUN numbers currently available to be used as either a source or clone.

-CanCreate

Indicates if a clone group can be created on this system. Valid answers are yes or no.

-Cpl

Indicates whether clone private LUNs are allocated and enabled on this system. Valid answers are yes or no.

-CplSPA

Displays the LUN number of the clone private LUN for SP A.

-CplSPB

Displays the LUN number of the clone private LUN for SP B.

-DriverVersion

Displays the version of the clone driver.

-MaxCloneGroupsUsingCPL

Displays the maximum number of clone groups that will use the clone private LUNs that this system supports.

-MaxCloneMemory

Displays the maximum amount of memory that the clone driver can allocate.

-MaxClonesPerGroup

Displays the maximum number of clones per clone group.

-MaxLUNsPerSource

Displays the maximum number of LUNs allowed in a source.

-MinCplSize

Displays the minimum size allowed, in blocks, for each clone private LUN.

EXAMPLE

```
naviseccli -address ss1_spa clone -listclonefeature CanCreate:  No

MaxCloneGroupsUsingCPL:  50

MaxClonesPerGroup :  8

MaxLUNsPerSource:  1

MaxCloneMemory:  10485760

Cpl:  Yes

CplSPA:  2

CplSPB:  3
```

```
MinCplSize:  250000

DriverVersion:  2

AvailableLUNs:

AllowProtectedRestore:  No
```

clone | snapview -listclonegroup

Displays clone group information.

PREREQUISITES

You must have a user account on the system on which you want the command executed.

DESCRIPTION

The **naviseccli clone** or the **naviseccli snapview** command with **-listclonegroup** and no other switches lists general information for a clone group. You can obtain more specific information with switches.

SYNTAX

```
clone | snapview -listclonegroup [-all]
[-CloneCount]
[-CloneGroupUid]
[-Clones]
[-CloneLunWWNs]
[-Description]
[-InSync]
[-IsControllingSP]
[-Name [name]]
[-QuiesceThreshold]
[-SourceLUNSize]
[-SourceMediaFailure]
[-Sources]
```

OPTIONS

-all

Lists all the properties of a clone without having to type in any other switch. This switch must be specified to know the **-timeoffracture** of the clone.

-CloneCount

Displays the number of clones and clone names defined in the clone group.

-CloneGroupUid

Displays the Uid and clone name. The Uid is the 16-byte unique ID assigned when the clone group was created.

-Clones

Displays the following information about each clone:

CloneID	Identification number of the clone. This number is unique per clone group, not system.
CloneState	Values include consistent, out-of-sync, remote mirror synchronizing, reverse-out-of-sync, reverse-synchronizing, synchronized or synchronizing
CloneCondition	Values include Administratively Fractured, System Fractured, Waiting on administrator to initiate synchronization, Queued to be synchronized, Synchronizing, Normal, or Unknown.
AvailableForIO	Clone LUN availability for I/O from an attached server: **yes** or **no**.
CloneMedia Failure	Whether clone media failure occurred: **yes** or **no**.
IsDirty	Clone containing writes occurred from a source other than the clone group source: **yes** or **no**.
IsFractured	Clone fractured state: **yes** or **no**.
PercentSynced	Percentage of the clone instance that is currently synchronized with its source. Also applies to reverse-synchronizing operations.
RecoveryPolicy	A user-defined value: **Automatic** or **Manual**.
SyncRate	A user-defined value: **high/medium/low**.
CloneLUNs	List of clone LUN numbers.
UseProtected Restore	State of the clone Protected Restore option: **yes** or **no**.

-CloneLUNWWNs

Displays the WWN of the clone.

-Description

Displays the descriptions and clone names in the clone group.

-InSync

Indicates whether the source LUN is available for I/O.

-IsControllingSP

Indicates whether the SP specified in the command is the SP that owns the clone group (**yes** or **no**).

-Name *name*

Displays information for the clone group name as given to the clone group with the **-createclonegroup** function.

-QuiesceThreshold

Displays the amount of time that must pass after an I/O to the source LUN before the software places any of its unfractured clones in the synchronized state. The minimum value is 10, the maximum value is 3600.

-SourceLUNSize

Displays the names and combined size of the source LUNs.

-SourceMediaFailure

Indicates whether an error occurred during I/O with the source LUNs.

-Sources

Displays the LUN numbers that constitute the source in the clone group.

EXAMPLE

```
naviseccli -address ss1_spa clone -listclonegroup -Name clone_0 -all

Name:  clone_0

CloneGroupUid:  50:06:01:60:BB:20:10:DD:01:00:00:00:00:00:00:00

InSync:  Yes

Description:

QuiesceThreshold:  60

SourceMediaFailure:  No

IsControllingSP:  No

SourceLUNSize:  2097152

CloneCount:  1

Sources:  4

Clones:

CloneID:  0100000000000000
```

```
CloneState:  Consistent

CloneCondition:  Administratively Fractured

AvailableForIO:  Yes

CloneMediaFailure:  No

IsDirty:  No

PercentSynced:  N/A

RecoveryPolicy:  Auto

SyncRate:  Medium

CloneLUNs:  5

UseProtectedRestore:  No

IsFractured:  Yes

TimeofFracture:  09/22/09 02:55:55
```

clone | snapview -removeclone

Removes a clone LUN from a clone group.

PREREQUISITES

You must have a user account on the system on which you want the command executed.

To remove a clone from its clone group, the clone:

- must be fractured or in a synchronized or consistent state.
- *cannot* be in a synchronizing or reverse synchronizing state.
- *cannot* be in a queue to be synchronized.

Note: In an effort to control resource consumption, the SnapView driver limits a maximum of 40 concurrent synchronizations and/or reverse synchronizations per SP. Once this limit is met, the software queues all other synchronization and reverse synchronization requests.

- *cannot* be removed if it is in a reverse-out-of-sync state and it is the only clone in the clone group. If you remove a clone under these conditions, you cannot restore it. It is recommended that you perform a reverse synchronization operation from the clone and, when the reverse synchronization is successful, you should remove the last clone from the clone group.

DESCRIPTION

The **naviseccli clone** or the **naviseccli snapview** command with **-removeclone** removes a clone from its clone group. When you remove a clone from a clone group, the clone becomes a conventional (regular) LUN and is no longer associated with its source or clone group.

The clone group itself persists until you remove it using **-destroyclonegroup**.

SYNTAX

clone | snapview -removeclone -name *name*| **-CloneGroupUid** *uid* **-cloneid** *id* [**-o**]

OPTIONS

-name *name*

Identifies the clone group. Use the name assigned when the clone group was created with **-createclonegroup**. To identify a clone group, you can use either the clone name or the clone group unique ID.

-CloneGroupUid *uid*

Specifies the 16-byte unique ID the software assigned when the clone group was created. The clone group ID consists of the numbers 0 through 9 and the letters A through F (these letters are not case sensitive). You can use the **-listclonegroup** command function to obtain the clone group ID (see clone | snapview -listclonegroup on page 1022).

-cloneid *id*

Specifies the 16-character clone ID of the system assigned when the clone was added. You can obtain this using the **-listclonegroup** command function. The *id* is numeric.

-o

Tells the CLI to execute the command without waiting for confirmation.

EXAMPLE

```
naviseccli -address ss1_spa clone -removeclone -name db3_clone -o
```

OUTPUT

None if the command succeeds; status or error information if it fails.

clone | snapview -resetfracturelog

Marks all data chunks of the source or clone LUN as being modified in the clone private LUN log. This allows you to perform a full synchronization or reverse-synchronization.

PREREQUISITES

You must have a user account on the system on which you want the command executed.

You can use this switch only if the clone was administratively fractured and the clone is in an out-of-sync or reverse-out-of-sync state.

DESCRIPTION

The **naviseccli clone** or the **naviseccli snapview** command with **-resetfracturelog** simulates server writes to the source or clone LUN, marking all data chunks on the LUN as being modified (changed).

SYNTAX

clone | snapview -resetfracturelog -name *name*| **-CloneGroupUid** *uid* **-cloneid** *id* [**-o**]

OPTIONS

-name *name*

Identifies the clone group. Use the name assigned when the clone group was created with **-createclonegroup**. To identify a clone group, you can use either the clone name or the clone group unique ID.

-CloneGroupUid *uid*

Specifies the 16-byte unique ID the software assigned when the clone group was created. The clone group ID consists of the numbers 0 through 9 and the letters A through F (these letters are not case sensitive). You can use the **-listclonegroup** command function to obtain the clone group ID (see clone | snapview -listclonegroup on page 1022).

-cloneid *id*

Specifies the 16-character clone ID the system assigned when the clone was added. You can obtain this using the **-listclonegroup** command function. The id is numeric.

-o

Tells the CLI to execute the command without waiting for confirmation.

EXAMPLE

```
naviseccli -address ss1_spa clone -resetfracturelog -name db3_clone
```

OUTPUT

None if the command succeeds; status or error information if it fails.

POSTREQUISITES

After issuing the **-resetfracturelog** command, you must issue a synchronization or reverse-synchronization. This will initiate a full synchronization or reverse-synchronization since all data chunks were marked as being modified.

Note: Performing multiple full synchronizations or reverse-synchronizations at the same time may affect performance on other system resources.

---

clone | snapview -reversesyncclone

Overwrites the source LUN with data from the clone LUN.

PREREQUISITES

You must have a user account on the system on which you want the command executed.

Important: You cannot reverse synchronize the clone if the clone's source is a MirrorView secondary image or a MirrorView primary image with unfractured secondaries.

To reverse synchronize a fractured clone, the following must be true:

- The clone is not in an out-of-sync state.
- Another clone in the clone group is not in a synchronizing or reverse synchronizing state.

For a Windows operating system, you must disable the indexing service and recycle bin on the source LUN of the clone. This prevents data corruption during reverse synchronization.

DESCRIPTION

The **naviseccli clone** or the **naviseccli snapview** command with **-reversesyncclone** replaces the data on the source LUN with the data on the clone. This allows you to revert to an earlier copy of the source LUN, for instance if the source became corrupted.

To ensure that there is no data corruption on the source LUN, you have to take the source LUN offline before you initiate the reverse synchronization. Once the operation begins, you can bring the source LUN back online.

When you initiate a reverse synchronization from Navisphere, the software immediately fractures all the clones in the clone group and then the software unfractures the clone from which you initiated the reverse synchronization. The software then copies the data chunks that differ between the source and the clone to the source LUN. The source LUN can instantly access the data, while the actual copying continues in the background.

Writes to the source LUN

Any server writes made to the source LUN after the clone was originally fractured are overwritten with the data on the clone. Any unmodified (unchanged) chunks of data are not rewritten to the source. After the reverse synchronization has completed, the clone that initiated the reverse synchronization remains unfractured.

Note: If you issue the **-UseProtectedRestore** 1 switch with the **clone | snapview -reversesyncclone** command, after the reverse synchronization has completed, SnapView fractures the clone that initiated the reverse synchronization.

During a reverse synchronization, the software automatically copies any server writes made from the source LUN to the clone. If you do not want source writes copied to the clone during a reverse synchronization, you must issue the **-UseProtectedRestore** 1 switch with the **clone | snapview -reversesyncclone** command.

Note: If you modify the same data chunk on the clone more than once, the software copies only the last modification to the source LUN.

The Protected Restore feature protects the data on a clone during a reverse synchronization. When you select this feature, during a reverse synchronization the software will not copy any server writes made from the source LUN to the clone. Instead, the software records information in the clone private LUN to identify the source LUN writes for subsequent synchronizations.

Once you initiate a reverse synchronization, the software immediately unfractures the clone that initiated the reverse synchronization. Then the software fractures any other clones in the clone group in order to protect them from corruption should the reverse synchronization operation fail. The software then begins to copy its data to its source LUN. After the reverse synchronization has completed, the software fractures the clone that initiated the reverse synchronization.

You can enable the Protected Restore feature on a per-clone basis (and not on a per-clone-group basis). You can select this feature when you first add a clone to a clone group (`clone | snapview -addclone -UseProtectedRestore 1`) or at any time before you perform a reverse synchronization (`clone | snapview -listclone -UseProtectedRestore 1`).

Note: Before you can initiate the **Protected Restore** feature, you must globally enable it by issuing the

clone | snapview -changeclonefeature [**-AllowProtectedRestore** 1]

command. When you select this option, the SnapView driver automatically allocates 8 MB of additional memory per SP. The additional memory is fixed and is used to monitor modified blocks on the source LUN, in order to prevent these blocks from being overwritten by the clone during a reverse synchronization. This additional memory counts against the total replication software memory budget.

While the clone is reverse synchronizing, you cannot:

- add a clone to the clone group
- remove the clone that is reverse synchronizing from the clone group
- synchronize any clone in the clone group
- reverse synchronize any clone in the clone group

SYNTAX

clone | snapview -reversesyncclone -name *name*|**-clonegroupUid** *uid* **-cloneid** *id* [**-UseProtectedRestore** 0|1]
[**-o**]

OPTIONS

-clonegroupUid *uid*

Specifies the 16-byte unique ID the software assigned when the clone group was created. The clone group ID consists of the numbers 0 through 9 and the letters A through F (these letters are not case sensitive). You can use the **-listclonegroup** command function to obtain the clone group ID (see clone | snapview -listclonegroup on page 1022).

-cloneid *id*

Specifies the 16-character clone ID the system assigned when the clone was added. You can obtain this using the **-listclonegroup** command function. The id is numeric.

-name *name*

Identifies the clone group. Use the name assigned when the clone group was created with **-createclonegroup**. To identify a clone group, you can use either the clone name or the clone group unique ID.

-o

Tells the CLI to execute the command without waiting for confirmation.

-UseProtectedRestore 0|1

Specifies the way the software will react when I/O is received during a reverse synchronizing operation.

0-Updates the clone with I/O to the source LUN.

1-Does not update the clone with I/O to the source LUN.

This property is available only if the option is supported on the targeted system.

EXAMPLE

```
naviseccli -address ss1_spa clone -reversesyncclone -name db3_clone -cloneid
 0100000000000000 -o
```

OUTPUT

None if the command succeeds; status or error information if it fails.

clone | snapview -syncclone

Starts copying the data on a source LUN to its clone.

PREREQUISITES

You must have a user account on the system on which you want the command executed.

To synchronize a fractured clone, the following must be true:

- The clone cannot be in a reverse-out-of-sync state.
- Another clone in the clone group cannot be in a reverse synchronizing state.
- If a clone is system fractured, you must manually fracture the clone before you can synchronize it.

For a Windows operating system, the indexing service and recycle bin must be disabled on the clone LUN. This prevents data corruption during the synchronization.

DESCRIPTION

The **`naviseccli clone`** or the **`naviseccli snapview`** command with **`-syncclone`** begins the process of synchronization: the copying of data on the source LUN to its clone. The purpose of synchronizing a fractured clone is to update the contents on the clone with its source LUN. Once you synchronize a fractured clone, the clone becomes unfractured and behaves the same as a newly added clone in a clone group.

When you initiate a synchronization, the software copies the data chunks that are different between the source LUN and the clone LUN to the clone. The software also copies any server writes from the source LUN to the clone LUN. The software does not copy any unmodified chunks to the clone.

Note: If the same chunk of data is modified on the source LUN more than once, only the last modification is copied to the clone.

While the clone is synchronizing, you:

- *cannot* remove the clone in a synchronizing state.
- *cannot* perform a reverse synchronization with any other clone in the clone group.

Note: In an effort to control resource consumption, the SnapView driver limits a maximum of 40 concurrent synchronizations and/or reverse synchronizations per SP. Once this limit is met, the software queues all other synchronization and reverse synchronization requests.

SYNTAX

clone | snapview -syncclone -name *name*| **-CloneGroupUid** *uid* **-cloneid** *id* [**-o**]

OPTIONS

-name *name*

Identifies the clone group. Use the name assigned when the clone group was created with **-createclonegroup**. To identify a clone group, you can use either the clone name or the clone group unique ID.

-CloneGroupUid *uid*

Specifies the 16-byte unique ID the software assigned when the clone group was created. The clone group ID consists of the numbers 0 through 9 and the letters A through F (these letters are not case sensitive). You can use the **-listclonegroup** command function to obtain the clone group ID (see clone | snapview -listclonegroup on page 1022).

-cloneid *id*

Specifies the 16-character clone ID the system assigned when the clone was added. You can obtain this using the **-listclonegroup** command function. The id is numeric.

-o

Tells the CLI to execute the command without waiting for confirmation.

EXAMPLE

Note: Before issuing the synchronization command, you should flush all cached data to the source LUN.

These commands list the state of all clone groups on system SP **ss1_spa**, and then start synchronization of the clone **db3_clone**.

```
naviseccli -address ss1_spa clone -listclonegroup

naviseccli -address ss1_spa clone -syncclone -name db3_clone -cloneid
0100000000000000 -o

Name:  db3_clone

CloneGroupUid:  50:06:01:60:20:04:21:3E:0C:00:00:00:00:00:00:00

InSync:  Yes

Description:

QuiesceThreshold:  60

SourceLUNSize:  2097152

CloneCount:  2

Sources:  16

Clones:

CloneID:  0100000000000000
```

OUTPUT

None if the command succeeds; status or error information if it fails.

Admsnap commands for clones

This section explains how to use the admsnap utility software with SnapView clones.

Note: Scripts that run from Windows 2000 servers will not support the complete set of CX4 features. Refer to the ESM for more detailed information.

The clone feature is supported only on CX4 series, CX3 series, CX series, and AX4-5 series with Navisphere Manager/Unisphere enabler and the SnapView enabler installed.

About admsnap software and clones

The admsnap utility is an executable program that you can run interactively with a script to manage clones. The admsnap utility resides on the servers connected to the system with the SnapView driver. You must execute the following admsnap commands from one of these attached servers:

- **admsnap clone_activate** – scans for new devices and, for Windows, assigns a drive letter.
- **admsnap clone_deactivate** – flushes server buffers and removes the drive letter assigned with **clone_activate** (Windows only).
- **admsnap flush** – flushes data from a source LUN to its clone, so that the source and clone are in a synchronized state.
- **admsnap list** – lists devices and their World Wide Name (WWN) within the operating system.

Note: The admsnap software supports native device names and PowerPath pseudo-device names. If you use a PowerPath pseudo-device name, you can add this device name to the `etc/fstab` file (for Linux) or to the `etc/vfstab` file (for Solaris). Admsnap supports both device naming scheme and enclosure naming scheme for Veritas.

For a step-by-step overview and examples on setting up and using clones with admsnap and Navisphere CLI, refer to SnapView examples on page 1103.

Requirements for admsnap and clones

Before you can use admsnap for clones, the following must be true.

General requirements

- The server must have access to Navisphere CLI. This is required to create a prerequisite LUN called a clone private LUN and to create clones.

- The system must have the SnapView software installed.
- The production and secondary servers must have both the Unisphere Host Agent and admsnap software installed. To install the host agent and admsnap, refer to the EMC Block server support products guide for your operating system.

Platform-specific requirements

- For HP-UX, admsnap requires a volume group entry for each path to the system. The entry or entries can be contained in a single volume group or multiple volume groups. On the destination system, the volume group entry or entries must specify a clone.

admsnap clone_activate

Scans for new LUNs on the secondary server.

PREREQUISITES

You must have administrative privileges on the secondary server.

Before this command will work, a clone group must exist (**clone | snapview -createclonegroup**) and a clone must already exist (that is, you must start one by adding a LUN to the clone group using **clone | snapview -addclone**). Then you must fracture the clone and add it to a storage group that is connected to the secondary server.

DESCRIPTION

The admsnap **clone_activate** command scans for new devices and, for Windows, assigns a drive letter to every new device it finds. When you activate a clone and add it to a storage group, the clone becomes accessible on the secondary server.

Note: Although the **clone_activate** command is prefixed with the term clone, you may issue this command on any device that requires a scan for new LUNs and, for Windows only, for the assignment of a drive letter.

Depending on your operating system, the **admsnap clone_activate** command will do the following:

Server OS	Function description
Windows	Scans for new devices and assigns a drive letter to every new device it finds. Windows 2000 - If the clone was already mounted on the secondary server, a reboot is recommended but not required after you activate the fractured clone. For Windows Remote Desktop and Terminal Services - If a terminal server is running on the secondary server, you must remove and disable it before using the **clone_activate** command. If you have the terminal server enabled, it prevents the command from working properly.
AIX, HP-UX, and Solaris	Rescans the bus for new devices.
Linux	The **clone_activate** command is not supported. You must either reboot the server or unload and load the HBA driver.
NetWare	The **clone_activate** command is not supported. Run the command **list_devices** or use the command **scan_all_LUNs** on the console.

SYNTAX

```
admsnap clone_activate [-h]
```

OPTIONS

-h

Lists the help output for a given operation. If you use this option on the command line, a help message is displayed for each option you specify. Admsnap will not perform the command; it lists the help output only.

This option is valid for Windows, Solaris, HP-UX, and AIX systems only.

EXAMPLE

```
admsnap clone_activate
```

admsnap clone_deactivate

Flushes server buffers and removes assigned drive letters. This command is supported on Windows systems only.

PREREQUISITES

You must have administrative privileges on the secondary server.

You must use this command on a secondary server after the clone has been activated and before you synchronize the fractured clone, or on the production server before you reverse synchronize a fractured clone.

DESCRIPTION

On a Windows server, the **admsnap clone_deactivate** command flushes all server buffers and removes the drive letter assigned by **clone_activate**. When you deactivate a clone, the software takes the clone offline making it inaccessible to the secondary server.

Note: Although the **clone_deactivate** command is prefixed with the term clone, you may issue this command on any Windows device that requires a volume to be taken offline, making it inaccessible to the secondary server. After you issue the deactivate command, you can remove the clone from the storage group.

Server OS	Function description
Windows	Flushes all server buffers and removes the drive letter assigned by **clone_activate**. This operation will attempt to take the device offline and to make it inaccessible by the operating system. To bring the device back online, you must issue the **clone_activate** command. For Windows Remote Desktop and Terminal Services - If a terminal server is running on the secondary server, you must remove and disable it before using the **clone_deactivate** command. If you have the terminal server enabled, it prevents the **clone_deactivate** command from working properly. For Microsoft Cluster Services (MSCS) - When you need to stop I/O to a clone or a clone's source LUN, you must take the clone LUN offline in order to ensure MSCS stops generating I/O. You must do this in addition to using the **admsnap clone_deactivate** command. You can take the clone LUNs offline by doing the following: 1. Locate the MSCS Disk Group resource that includes the clone LUNs. 2. Use the Microsoft Cluster Administrator to take the Disk Group offline by right-clicking the Disk Group and selecting Take Offline. 3. Perform the clone operation. When you are ready to resume I/O to the disk, use the Microsoft Cluster Administrator to bring the Disk Group(s) back online by right-clicking the Disk Group and selecting Bring Online.

Server OS	Function description
AIX, HP-UX, and Solaris	The **clone_deactivate** command is not supported; it is provided for script compatibility between Windows and UNIX only. If you issue the command on this server, admsnap will return an error. Unmount the file system by issuing the **umount** command. If you cannot unmount the file system, you can use the **sync** command to flush buffers. The **sync** command is not considered a substitute for unmounting the file system, but you can use it to reduce the number of times you have to issue the **fsck** command on your backup server's file system. Refer to your system's man pages for **sync** command usage.
Linux	The **clone_deactivate** command is not supported. You must either reboot the server or unload and load the HBA driver.
NetWare	The **clone_deactivate** command is not supported. Use the **dismount** command on the clone volume to dismount the file system.

SYNTAX

admsnap clone_deactivate [**-h**] **-o** *object_name* [**-t** *object_type*]

OPTIONS

-h

Lists the help output for a given operation. If you use this option on the command line, a help message is displayed for each option you specify. Admsnap will not perform the command; it lists the help output only.

-o *object_name*

Specifies an object name. The object name must be a device name or drive letter. If the device name is provided as an object name, admsnap will find the associated device and drive letter. It will then delete the drive letter, dismount the device and take the device offline.

If you use the **-t** option, the device name must be a valid name for the type of object specified with the **-t** option.

-t *object_type*

Specifies the object type. Valid Windows object types are device and drive letter.

If you do not specify the **-t** option, admsnap will attempt to determine the correct object type and report a failure if it cannot.

EXAMPLE

Windows example:

```
admsnap clone_deactivate -o e:
```

admsnap flush

Flushes all data that has been written to the source LUN.

DESCRIPTION

The **admsnap flush** command clears buffers and flushes all data to a LUN.

Use it on the source LUN's server before fracturing a clone to ensure that all cached data has been written to the clone.

Depending on your operating system, the **admsnap flush** command will do the following:

Server OS[a]	Function description
Windows	Writes the data from the buffers to the disk.
AIX, HP-UX, Linux, and Solaris	Writes the data from the buffers to the disk. We recommend that you unmount the file system by issuing the **umount** command to ensure that no additional source writes are in process. If you are unable to unmount the file system, you can issue the admsnap **flush** command[b].
NetWare	The **flush** command is not supported. Dismount the file system by using the **dismount** command on the volume.

SYNTAX

admsnap flush [**-h**] **-o** *object_name* [**-t** *object_type*]

OPTIONS

-h

Lists the help output for a given operation. If you use this option on the command line, a help message is displayed for each option you specify. Admsnap will not perform the command; it lists the help output only.

This option is valid for Windows, Solaris, HP-UX, Linux, and AIX systems.

[a] With some operating systems, you may need to shut down the application to flush the data. Specific operating systems have different requirements.

[b] Neither the **flush** command nor the **sync** command is a substitute for unmounting the file system. Both commands only complement unmounting the file system.

-o *object_name*

Specifies an object name. Valid Windows object names are drive letter and physical drive name. Valid Solaris object names are device names, file system names, or Veritas volume names. For HP-UX and Linux, a valid object name is either a device name, a file system name or Veritas volume name. For AIX, a valid object name is either a device name or a file system name.

If you use the **-t** option, the device name must be a valid name for the type of object specified with the **-t** option.

-t *object_type*

Specifies the object type. This switch is supported on Windows or UNIX operating systems only. Valid Windows object types are device and drive letter. Valid UNIX object types are device, volume, and file system. If the object type name contains spaces, enter the name without spaces.

If you do not specify the **-t** option, admsnap will try to determine the correct object type and will report a failure if it cannot.

EXAMPLE

Windows example:

```
admsnap flush -o E:
```

admsnap list

Performs a list operation and provides the World Wide Name (WWN) of all supported devices on the system.

PREREQUISITES

You must have administrative privileges on the production and secondary server.

DESCRIPTION

The **admsnap list** command will attempt to list devices and their World Wide Names (or WWN) on the operating system. You can use the WWN to distinguish one operating system device from another.

The **admsnap list** command is supported on Windows, Solaris, HP-UX, Linux, and AIX systems only.

SYNTAX

```
admsnap list [-h]
[-l lun_wwn]
[-d object_name]
[-a output_format]
```

OPTIONS

[-h]

Lists the help output for a given operation. If you use this option on the command line, a help message is displayed for each option you specify. Admsnap will not perform the command; it lists the help output only.

This option is valid for Windows, Solaris, HP-UX, Linux, and AIX systems.

[-l *lun_wwn*]

Lists the device name for the WWN you specify. The WWN must be in a valid WWN format.

[-d *object_name*]

Specifies an object name that must be a device name, file system mount point, a Veritas volume name, or a drive letter.

Note: The **-a** option is ignored when used with the **-d** option and the object name argument is a Windows device name, for instance `\\.\PhysicalDrive1`.

[-a *output_format*]

Specifies an alternative output style on a Windows server. The default Windows output style is to list the drive letter and its WWN. The output style must be a valid style that is either a drive letter (default if **-a** is not specified at all) or a physical drive.

Note: The **-a** option is ignored when used with the **-d** option and the object name argument is a Windows device name, for instance `\\.\PhysicalDrive1`.

EXAMPLE

Windows example:

```
admsnap list -d E:
```

SnapView Snapshot CLI commands

This section explains the SnapView snapshot CLI commands that manage SnapView snapshots.

Note: If you currently use Classic CLI to issue CLI commands, please note that Secure CLI is replacing Classic CLI; therefore, only Secure CLI will support new features. We recommend that you use Secure CLI. Secure CLI is faster and more secure than Classic CLI. Only commands issued to host agents are not currently supported using Secure CLI.

Setting up SnapView to use snapshots

This section describes how to set up SnapView to use snapshots.

Prerequisites for setting up snapshots

Before you can set up and use snapshots, the following must be true:

- Source LUNs must be bound. For a client or production server to access a source LUN, you must assign the source LUN to a storage group and connect the storage group to the production server. To do this, you must enable data access control on the system.
- For VMware ESX Servers, verify that the source LUN is presented to the virtual machine (guest operating system running on the virtual machine). For information on how to present a LUN to the virtual machine, refer to the VMware documentation that shipped with your ESX Server.
- For configuration restrictions when using VMFS volumes, go to the E-Lab Interoperability Navigator on EMC Powerlink and under the **PDFs and Guides** tab, open the **VMware ESX server.pdf** file.
- For a secondary server to access the snapshot, you must assign the snapshot to a storage group. The storage group must be connected to the secondary server that will activate the snapshot. You must assign the snapshot to a storage group other than the storage group that holds the source LUN. EMC supports placing a snapshot in the same storage group as its source LUN only if you use Replication Manager or Replication Manager/SE to put the snapshot in the storage group. This software provides same host access to the snapshot and the source LUN. For information on using these software products, refer to the documentation for the product.

  If you have a VMware ESX Server, the snapshot and source LUNs must be accessed by different virtual machines, unless the virtual machine is running one of the software programs that supports same host access.

  Note: VMware ESX Servers must activate the snapshot before adding it to a storage group.

- Reserved LUNs must be bound and added to the reserved LUN pool before starting a SnapView session. You must add a reserved LUN to the reserved LUN pool for each source LUN you will replicate. To configure the reserved LUN pool, refer to the chapter on the reserved LUN pool in the latest revision of the *EMC Navisphere Command Line Interface (CLI) Reference*.

Note: Thin LUNs are not eligible for use as reserved LUNs.

Overview of setting up SnapView to use snapshots

The following is a checklist for setting up SnapView snapshots.

Note: You must complete the prerequisites for setting up snapshots, as listed on page 121 , before you can perform any of the following procedures.

- Start a SnapView session, refer to snapview -startsession on page 1074.

  Note: You can create a snapshot before starting a session but the snapshot has no use until you start a session on it. A secondary server can then activate the snapshot to the session.

- Create a snapshot, refer to snapview -createsnapshot on page 1054.
- If you do not have a VMware ESX Server - Add the snapshot to a storage group connected to the server that will access the snapshot. Refer to the *EMC Navisphere Command Line Interface (CLI) Reference*.

  If you have a VMware ESX Server - Activate the snapshot, refer to page 127. After you have activated the snapshot, do the following:

  1. Add the snapshot to a storage group connected to the ESX Server that will access the snapshot. Refer to the *EMC Navisphere Command Line Interface (CLI) Reference*.
  2. Rescan the bus at the ESX Server level.
  3. If a virtual machine is already running, power off the virtual machine and use the Service Console of the ESX Server to assign the snapshot to the virtual machine. If a virtual machine is not running, create a virtual machine on the ESX Server and assign the snapshot to the virtual machine.

     If a virtual machine is not running, create a virtual machine on the ESX Server and assign the snapshot to the virtual machine.
  4. Power on the virtual machine. If the snapshot is already presented to the virtual machine, rescan the bus at the virtual machine level. For virtual machines running Windows, you can use the **`admsnap activate`** command to rescan the bus.

Reserved LUN pool with SnapView

The reserved LUN pool consists of one or more private LUNs and works with SnapView sessions and snapshots. The reserved LUN pool stores the original source LUN data chunks that have been modified since the start of the session. For any one session, the contents of a reserved LUN(s) and any unchanged source LUN(s) blocks compose the snapshot.

Server writes made to an activated snapshot are also stored on a reserved LUN in the global reserved LUN pool. When you deactivate the snapshot, the reserved LUN space is freed and all snapshot writes are destroyed.

Before starting a session, the reserved LUN pool must contain at least one LUN for each source LUN that will be starting a session. You can add any LUNs that are available to the reserved LUN pool. Each system manages its own LUN pool and assigns a separate reserved LUN (or multiple LUNs) to each SnapView source LUN. Multiple sessions of a single source LUN will share the same reserved LUN or LUNs.

If the reserved LUN fills up and there are no available reserved LUNs in the reserved LUN pool, the software automatically terminates the session that is trying to allocate reserved LUN space, logs an error, releases the reserved LUN(s) used by this session, and returns them to the reserved LUN pool. The software also destroys all copy-on-first-write data stored in the reserved LUN pool for that session. At this point, the snapshot becomes inactive and any server that has mounted volumes on the snapshot will receive I/O errors and lose access.

If you have multiple sessions of a single source LUN and the reserved LUN fills up, when the production server modifies a chunk on the source LUN, resulting in a copy-on-first-write, every session that has the same chunk will be terminated if no additional LUNs are available in the reserved LUN pool. Other sessions that did not have this chunk will continue to run and use the reserved LUN space that the terminated sessions were using.

Note: SnapView, incremental SAN Copy, and MirrorView/Asynchronous share the LUN resources of the reserved LUN pool. For example, if you are running an incremental SAN Copy session on one LUN and a SnapView session on another LUN, the reserved LUN pool must contain at least two LUNs - one for each source LUN. If both sessions are running on the same source LUN, the sessions will share a reserved LUN.

Configuring the reserved LUN pool

You must configure the reserved LUN pool before you start a SnapView session. Use Navisphere CLI to configure the reserved LUN pool (refer to the latest revision of *EMC Command Line Interface (CLI) Reference*). The CLI Reference also explains how you can manually estimate a suitable LUN pool size.

Note: Thin LUNs are not eligible for use as reserved LUNs.

---

fSnapView command functions

The naviseccli or navicli snapview functions, listed alphabetically, are:

- snapview -activatesnapshot
- snapview -chgrollback
- snapview -chgsnapshot
- snapview -createsnapshot
- snapview -deactivatesnapshot
- snapview -destroysnapshot
- snapview -listrollback
- snapview -listsnapshots
- snapview -listsessions
- snapview -listsnapableluns
- snapview -lunpool
- snapview -preparesnapshot
- snapview -rmsnapshot
- snapview -startrollback
- snapview -startsession
- snapview -stopsession

Note: For information on which commands are supported with AX4-5 series or AX series systems, refer to SnapView CLI commands supported for AX4-5 series or AX series systems on page 1127

In Table 32 on page 1048, the SnapView snapshot CLI functions are listed alphabetically according to essential and optional functions.

Table 32. naviseccli or navicli SnapView command functions

Command	Description
Essential functions (alphabetically)	
snapview -activatesnapshot or admsnap -activate	Associates a session with a snapshot LUN, required for multiple sessions on a LUN(s). The **admsnap activate** command returns a drive letter or device name of the snapshot.

snapview -createsnapshot or snapview -preparesnapshot	Creates a snapshot LUN. The snapview preparesnapshot command also allocates the required disk resources. The -preparesnapshot switch is supported with Navisphere Express only.
snapview -startrollback	Starts a rollback on the selected SnapView session.
snapview -startsession	Starts a single SnapView session.
snapview -stopsession	Stops a SnapView session.
Optional status functions (alphabetically)	
snapview -listrollback	Displays rollback information such as the rollback status and performance statistics.
snapview -listsessions	Displays information on all active SnapView sessions.
snapview -listsnapableluns	Displays the unique IDs of all potential snapshot source LUNs.
snapview -listsnapshots	Displays information on snapshot LUNs.
snapview -lunpool	Lists all reserved LUNs that are currently being used with SnapView.
Optional reconfiguration functions (alphabetically)	
snapview -chgrollback	Changes the rollback rate.
snapview -chgsnapshot	Renames a snapshot LUN.
snapview -deactivatesnapshot	Removes the association of a session with a snapshot LUN.
snapview -destroysnapshot	Frees and deallocates the snapshot disk resources for an AX4-5 series system with Navisphere Express.
snapview -rmsnapshot or snapview -destroysnapshot	Removes (deletes) a snapshot LUN. The -destroysnapshot switch is supported with Navisphere Express only.

snapview -activatesnapshot

Activates a snapshot LUN with a session.

PREREQUISITES

For naviseccli, you must have a user account on the system on which you want to execute the command. For navicli, you must have a username/server entry in the Navisphere SP Agent configuration file.

A session must already exist (that is, you must start one using **`snapview -startsession`**) and a snapshot LUN must exist (**`snapview -createsnapshot`**) before this command will work.

If you have a VMware ESX Server, you must activate the snapshot before you add it to a storage group.

DESCRIPTION

The **naviseccli** or **navicli snapview** command with **-activatesnapshot** maps a snapshot LUN to a SnapView session. When you activate a snapshot to a session, the session becomes accessible on the secondary server's system.

Note: You must issue this command to the SP that owns the source LUN(s); otherwise, the command will fail.

Once a secondary server activates a snapshot to a session, this server can write to the activated snapshot. The software stores all writes made to the snapshot in the reserved LUN pool. If the secondary server deactivates the snapshot from the session, the software destroys all writes made to the session.

Note: The **snapview -activatesnapshot** command has a similar function as the **admsnap activate** command, but the **snapview -activatesnapshot** command does not return snapshot device information or allow you to activate all snapshots using one command.

SYNTAX

snapview -activatesnapshot *sessionname* **-snapshotid** *uid* or **snapview -activatesnapshot** *sessionname* **-snapshotname** *name*

OPTIONS

-activatesnapshot *sessionname*

Specifies a session name (that you assigned when the session was started with **-startsession**).

-snapshotid *uid*

Specifies the 32-byte unique ID of the snapshot (assigned by the system when the copy was created with **-createsnapshot**).

-snapshotname *name*

Specifies the name of the snapshot (that you optionally assigned when the copy was created with **-createsnapshot**).

EXAMPLE

For SP **ss1_spa**, these commands start a session named **2pmsession** with snapshot **LUN lun20copy**, and then associate the session and snapshot. The copy then becomes accessible on the secondary server's system.

Note: To use this command with navicli, replace naviseccli with navicli.

```
naviseccli -h ss1_spa snapview -startsession 2pmsession -snapshotname
lun20copy

naviseccli -h ss1_spa snapview -activatesnapshot 2pmsession -snapshotname
lun20copy
```

OUTPUT

If the version of software running on the SP does not support this command, a `Command is not supported` error message is printed to **`stderr`**.

snapview -chgrollback

Changes the rollback rate.

PREREQUISITES

For naviseccli, you must have a user account on the system on which you want to execute the command. For navicli, you must have a username/server entry in the Navisphere SP Agent configuration file.

DESCRIPTION

The **`naviseccli`** or **`navicli snapview`** command with **`-chgrollback`** changes the rate at which the data is copied back to the source LUN(s).

Note: If a session spans across both SPs or if the session is a consistent session, you can issue this command from either SP; otherwise, you must issue this command from the SP that owns the source LUN(s) or the command will fail.

SYNTAX

`snapview -chgrollback` *`sessionname`* **`-rate`** [*`high`*|*`medium`*|*`low`*]

OPTIONS

-chgrollback *sessionname*

Specifies the name for the SnapView session that is rolling back.

-rate high | medium | low

Specifies the rate at which the software copies the data back to the source LUN(s). Options are high, medium, or low. The default is medium.

EXAMPLE

For SP **ss1_spa**, this command changes the rollback rate to medium for the session named **rollbackTest**. There is no output for this command. You can verify the new rollback rate by issuing the **-listrollback -rate** command. For additional information about the **-listrollback command**, refer to snapview -listrollback on page 1058.

Note: To use this command with navicli, replace naviseccli with navicli.

```
naviseccli -h ss1_spa snapview -chgrollback rollbackTest -rate medium
```

OUTPUT

If the specified session is not rolling back, the software returns an error message.

If the version of software running on the SP does not support this command, a `Command is not supported` error message is printed to `stderr`.

snapview -chgsnapshot

Renames a snapshot. This switch is not supported on AX series systems or on AX4-5 series systems with Navisphere Express.

PREREQUISITES

For naviseccli, you must have a user account on the system on which you want to execute the command. For navicli, you must have a username/server entry in the Navisphere SP Agent configuration file.

DESCRIPTION

The **naviseccli** or **navicli snapview** command with **-chgsnapshot** changes the name of a snapshot.

Note: You can issue this command from either SP.

SYNTAX

snapview -chgsnapshot -snapshotid *uid* **-snapshotnewname** *newname* or **snapview -chgsnapshot -snapshotname** *name* **-snapshotnewname** *newname*

OPTIONS

-snapshotid *uid*

Specifies the 32-byte LUN unique ID (WWN) of the snapshot, assigned when the snapshot was created. For any letters in the ID, you must specify the same case that the software assigned to the image when the snapshot was created (use the **snapview -listsnapshots** function).

-snapshotname *name*

Specifies the existing name for the snapshot.

-snapshotnewname *newname*

Specifies the new name for the snapshot.

EXAMPLE

For SP **ss1_spa**, this command renames the snapshot named snap11am to snap3pm.

Note: To use this command with navicli, replace naviseccli with navicli.

```
naviseccli -h ss1_spa snapview -chgsnapshot -snapshotname snap11am
-snapshotnewname snap3pm
```

OUTPUT

If the version of software running on the SP does not support this command, a `Command is not supported` error message is printed to stderr.

snapview -createsnapshot

Creates a snapshot.

PREREQUISITES

For naviseccli, you must have a user account on the system on which you want to execute the command. For navicli, you must have a username/server entry in the Navisphere SP Agent configuration file.

DESCRIPTION

The **naviseccli** or **navicli snapview** command with **-createsnapshot** creates a snapshot. A snapshot is a virtual LUN and when activated (**-activatesnapshot**), it allows a secondary server to view a SnapView session. An active snapshot is a composite of a source LUN and reserved LUN data that lasts until you destroy the snapshot. You can create a snapshot before or after you start a session; however, the snapshot has no use until a secondary server activates it to a session.

Note: When you create a snapshot, SnapView automatically allocates and retains additional memory. This additional memory counts against the total replication software memory budget.

If the system loses power while the SnapView session is running, both the session and snapshot will survive the system power failure, since all sessions run in persistence mode.

You must issue this command to the SP that owns the source LUN(s); otherwise, the command will fail.

Note: Unless you have additional software that supports same host access, you must assign the snapshot to a storage group other than the storage group that holds the source LUN(s). You also must assign multiple snapshots, of the same source LUN(s), to different storage groups. For information on software that supports same host access, refer to the Prerequisites for setting up snapshots on page 1045.

SYNTAX

snapview -createsnapshot *lun* [**-snapshotname** *name*]

OPTIONS

-createsnapshot *lun*

Specifies the LUN ID of the source LUN(s).

-snapshotname *name*

Lets you assign a meaningful name to the snapshot; for example **2pmsnap**. You can use this name during the session to manage the snapshot. The name can include as many as 32 characters and spaces are allowed.

EXAMPLE

For SP **ss1_spa**, this **-createsnapshot** command creates a snapshot for the source LUN(s) that has the LUN ID 20. The snapshot name is **lun20snap**.

Note: To use this command with navicli, replace naviseccli with navicli.

```
naviseccli -h ss1_spa snapview
 -createsnapshot 20 -snapshotname lun20snap
```

OUTPUT

If the version of software running on the SP does not support this command, a `Command is not supported` error message is printed to stderr.

snapview -deactivatesnapshot

Removes the association between a SnapView session and a snapshot LUN.

PREREQUISITES

For naviseccli, you must have a user account on the system on which you want to execute the command. For navicli, you must have a username/server entry in the Navisphere SP Agent configuration file.

DESCRIPTION

The **naviseccli** or **navicli snapview** command with **-deactivatesnapshot** unmaps a snapshot from a SnapView session and destroys any secondary server writes made to the snapshot. The snapshot becomes inaccessible on the secondary server's system, while the session continues.

Note: You must issue this command to the SP that owns the source LUN(s); otherwise, the command will fail.

SYNTAX

snapview -deactivatesnapshot -snapshotid *uid* [**-o**] or **snapview -deactivatesnapshot -snapshotname** *name*
[**-o**]

OPTIONS

-snapshotid *uid*

Specifies the 32-byte unique ID of the snapshot (assigned when the copy was created with **-createsnapshot**).

-snapshotname *name*

Specifies the name of the snapshot (optionally assigned when the copy was created with **-createsnapshot**).

-o

Executes the command without prompting for confirmation.

EXAMPLE

For SP **ss1_spa**, this command removes the existing association between the snapshot **lun20copy** and its session. The snapshot then becomes inaccessible on the secondary server's system.

Note: To use this command with navicli, replace naviseccli with navicli.

```
naviseccli -h ss1_spa snapview -deactivatesnapshot -snapshotname lun20copy
```

OUTPUT

If the version of software running on the SP does not support this command, a `Command is not supported` error message is printed to stderr.

snapview -destroysnapshot

Frees and deallocates the snapshot disk resources for an AX4-5 series system with Navisphere Express.

PREREQUISITES

For naviseccli, you must have a user account on the system on which you want to execute the command.

DESCRIPTION

The **naviseccli snapview** command with the **-destroysnapshot** frees and deallocates the snapshot disk resources that were allocated when you prepared the snapshot. This command also removes the snapshot from the storage group and destroys the snapshot.

Before you destroy the snapshot, verify that you have:

- Removed access to the snapshot from the secondary server. If you omit this step, you will have to reboot the secondary server.
- Stopped the snapshot from the source server. If you omit this step, the snapshot will be stopped prior to the destroy.

Note: In Navisphere CLI, the point-in-time copy you start and stop is referred to as a session.

SYNTAX

snapview -destroysnapshot -hostname *name* [**-o**]

OPTIONS

-hostname *name*

Specifies the server name assigned to the snapshot. This server is referred to as the secondary server.

-o

Destroys the required snapshot disk resources and snapshot without prompting for confirmation.

EXAMPLE

For SP **ss1_spa**, this command removes the snapshot named **mysecondaryserver**.

```
naviseccli snapview -destroysnapshot -hostname mysecondaryserver
```

OUTPUT

If the version of software running on the SP does not support this command, a `Command is not supported` error message is printed to **stderr**.

snapview -listrollback

Displays rollback information, such as the rollback status and performance statistics.

PREREQUISITES

For **naviseccli**, you must have a user account on the system on which you want to execute the command. For **navicli**, you must have a username/server entry in the Navisphere SP Agent configuration file.

DESCRIPTION

Note: If a session spans across both SPs, the switches that provide statistical information will specify only the statistics for the SP in the **navicli** command.

The **naviseccli** or **navicli snapview** command with **-listrollback** and no other switches lists all rollback information. You can obtain more specific information with the switches described below.

Note: If a session spans across both SPs or if the session is a consistent session, you can issue this command from either SP; otherwise, you must issue this command to the SP that owns the source LUN(s) or the command will fail.

SYNTAX

```
snapview-listrollback [-name sessionname]
[-rate [-high|-medium|-low]]
[-complete]
[-incomplete]
[-reads]
[-writes]
[-spanreads]
[-spanwrites]
[-blocksread]
[-blockswritten]
[-rollbackpercent]
```

OPTIONS

-name *sessionname*

Specifies the name for the SnapView session that is rolling back. If you do not specify a session name, the software returns the names for all sessions that are rolling back on that SP.

-rate high|medium|low

Specifies the rate at which the software copies the data back to the source LUN(s). Values are high, medium, or low.

-complete

Displays the number of chunks that have been copied to the source LUN(s). This includes the number of chunks flushed and the number of chunks invalidated.

The number of chunks flushed is the number of reserved LUN chunks that have been copied from the session that is rolling back to the source LUN(s).

The number of chunks invalidated is the number of reserved LUN chunks that will not be copied to the source LUN(s). Server writes made to the source LUN(s) while the rollback is in progress will take precedence over the data chunks being rolled back.

-incomplete

Displays the number of copy-on-first-write chunks that have not been copied back to the session's source LUN(s).

-reads

Displays the number of server read requests made to the source LUN(s) during the rollback operation.

-writes

Displays the number of server write requests made to the source LUN(s) during the rollback operation.

-spanreads

Displays the number of server read requests made to the source LUN(s) during the rollback operation, which spanned a partial chunk.

-spanwrites

Displays the number of server write requests made to the source LUN(s) during the rollback operation, which spanned a partial chunk.

-blocksread

Displays the number of 512-byte disk blocks that were read by the source LUN's server during the rollback operation.

-blockswritten

Displays the number of 512-byte disk blocks that were written by the source LUN's server during the rollback operation. Server writes made to the source LUN(s) while the rollback is in progress will overwrite the data being rolled back.

-rollbackpercent

Displays the percentage of data chunks that have been copied to the source LUN(s).

EXAMPLE

You can specify no switches or only those that you are interested in, as illustrated in the examples below. A sample output is listed on page 1058.

```
naviseccli -h ss1_spa snapview -listrollback
```
Without any switches specified for SP **ss1_spa**, this command will display the statistics information for all sessions that are rolling back.

```
naviseccli -h ss1_spa snapview -listrollback -name
```
For SP **ss1_spa**, this command displays only the names of all sessions that are rolling back.

```
naviseccli -h ss1_spa snapview -listrollback -name sessionName
```
For SP **ss1_spa**, this command displays the statistics information for the specified session.

```
naviseccli -h ss1_spa snapview -listrollback -name -rate -complete
```
For SP **ss1_spa**, this command displays the rollback rate and the number of chunks completed for each session that is rolling back.

Note: To use this command with **navicli**, replace **naviseccli** with **navicli**.

OUTPUT

The following is a sample output that shows the devices controlled by one agent. Actual output varies depending on the switches you use with the **-listrollback** command.

```
Name of the session: rollbackTest

Session RollBack Rate:        low

Number of Chunks Complete: 1024

Chunks Flushed: 1024

Chunks Invalidated: 0

Number of Chunks Incomplete: 15293

Host Read Requests: 0

Host Write Requests: 0

Spanning Host Read Requests: 0

Spanning Host Write Requests: 0

Number of Blocks Read: 0

Number of Blocks Written: 0

Percent Rolled Back: 6.27566
```

If no session is rolling back, Navisphere CLI displays the following message:

```
No snap session on this SP is in the process of rolling back.
```

If the version of software running on the SP does not support this command, a `Command is not supported` error message is printed to **`stderr`**.

snapview -listsessions

Lists session performance statistics.

PREREQUISITES

For naviseccli, you must have a user account on the system on which you want to execute the command. For navicli, you must have a username/server entry in the Navisphere SP Agent configuration file.

DESCRIPTION

The **`naviseccli`** or **`navicli snapview`** command with **`-listsessions`** and no other switches lists information about all SnapView sessions. With the **`-name`** name switch, it lists all information on the specified session.

Note: If a session spans across both SPs or if the session is a consistent session, you can issue this command from either SP; otherwise, you must issue this command to the SP that owns the source LUN(s) or the command will fail.

SYNTAX

```
snapview -listsessions [-name [sessionname]]
[-all]
[-cacheusage]
[-consistent]
[-cowwrites]
[-creationtime]
[-includepeer]
[-luns]
[-lunwrites]
[-persistence]
[-readfromcache]
[-readslun]
[-readssnapshot]
[-reserved]
[-sessionstate]
[-snapshotsname]
[-snapshotsuid]
```

[**-tlunumber**]
[**-totalwrites**]
[**-writeslargerthansize**]

OPTIONS

-name [*sessionname*]

Specifies the name of the session to be described. If you omit *-sessionname*, the CLI displays all session names.

-all

Lists all properties of a session without having to type in any other switch.

-cacheusage

Displays the system's reserved LUN pool capacity in gigabytes and percentage of or total number of chunks used in this SnapView session.

-consistent

Lists whether the session is running in consistent mode.

-cowwrites

Displays the number of write requests to the reserved LUN pool that triggered a copy on first write.

-creationtime

Displays the time and date that the session was created.

-includepeer

Note: This feature is not supported on AX4-5 or AX series systems.

Lists sessions on the peer SP and LUNs from sessions spanning both SPs.

-luns

Lists the source LUNs used in the sessions.

-lunwrites

Displays the total number of write requests from the source LUN(s).

-persistence

Lists whether the session is running in persistence mode. Navisphere CLI version 6.24 or later enables persistence mode as the default.

-readfromcache

Displays the number of chunks read from the reserved LUN pool.

-readslun

Displays the total number of chunks read from the source LUN(s).

-readssnapshot

Displays the number of chunks read from the snapshot.

-reserved

Lists all reserved sessions. Reserved sessions are sessions used for another application such as SAN Copy and MirrorView/Asynchronous.

-sessionstate

Displays the state of the session: **Stopping**, **Normal**, or **Rolling Back**.

-snapshotsname

Lists the names of any active snapshots in this session.

-snapshotsuid

Lists the 16-byte LUN unique IDs of the snapshots in this session.

-tlunumber

Displays the LUN number of the source LUN(s).

-totalwrites

Displays the sum of write requests to the source LUN(s) and to the reserved LUN pool in the SnapView session.

-writeslargerthansize

Displays the number of write requests larger than the chunk size.

EXAMPLE

For SP **ss1_spa**, this command lists all sessions. A sample output follows.

Note: To use this command with navicli, replace naviseccli with navicli.

```
naviseccli -h ss1_spa snapview -listsessions
```

OUTPUT

The following is a sample output that shows the devices controlled by one agent. Actual output varies depending on the switches you use with the **-listsessions** command.

```
Name of the session: rollbackTest

Number of read requests serviced by the snapview reserved LUN pool: 65264

Total number of read requests on the snapview logical unit: 0

Number of reads from the TLU: 4294902032

Number of writes requests in the session: 65264

Number of writes requests to reserved LUN pool that triggered a COW: 0

Total number of writes requests on the snapview target logical unit: 65264

Number of writes requests larger than the chunk size: 0

LUN Pool Capacity in GB: 6

Session Usage for This SP: 33.257

List of Target Logical Units: LUN 8 LUN 9

snap Logical Units UID

snap Logical Units Name

Session in persistence: YES

Session creation time: 03/21/03 06:56:28

Session state: Normal
```

If the version of FLARE software running on the SP does not support this command, a `Command is not supported` error message is printed to **stderr**.

snapview -listsnapshots

Displays information on snapshot copies.

PREREQUISITES

For **naviseccli**, you must have a user account on the system on which you want to execute the command. For navicli, you must have a username/server entry in the Navisphere SP Agent configuration file.

DESCRIPTION

The **naviseccli** or **navicli snapview** command with **-listsnapshots** and no other switches lists all information on all snapshot copies.

With **-snapshotname** *name* or **-snapshotid** *uid*, it lists all information about one snapshot. The command works only after a snapview **-createsnapshot** command has created one or more snapshot copies.

Note: You can issue this command from either SP.

SYNTAX

```
snapview -listsnapshots [-lun]
[-name]
[-reserved]
[-snapshotname [name]]
[-snapshotid [uid]]
[-state]
```

OPTIONS

-lun

Lists source LUNs.

-name

Lists the SnapView session names.

-reserved

Lists all reserved snapshots. Reserved snapshots are snapshots used for another application such as SAN Copy and MirrorView/Asynchronous.

-snapshotname [*name***]**

Specifies the name of the snapshot assigned when the snapshot was created or the session started. If you omit name, it displays all snapshot names.

-snapshotid [*uid***]**

Specifies the unique ID of the snapshot. If you omit **uid**, it displays the unique IDs of all copies.

-state

Lists the state of the copy: **Active** or **Inactive**.

EXAMPLE

For SP **ss1_spa1**, this command lists all information on snapshot copies. A sample output follows.

Note: To use this command with navicli, replace naviseccli with navicli.

```
naviseccli -h ss1_spa snapview -listsnapshots
```

OUTPUT

The following is a sample output that shows the devices controlled by one agent. Actual output varies depending on the switches you use with the -listsnapshots command.

```
SnapView logical unit name: snapOnLun4

SnapView logical unit ID: 60:06:01:67:51:09:00:00:CD:2E:76:86:FE:5D:D7:11

Target Logical Unit: 4

State: Active

Session Name: sessionAtNoonOnLun4
```

If the version of software running on the SP does not support this command, a `Command is not supported` error message is printed to **`stderr`**.

snapview -listsnapableluns

Lists all source LUNs on which you can create a snapshot.

PREREQUISITES

For naviseccli, you must have a user account on the system on which you want to execute the command. For navicli, you must have a username/server entry in the Navisphere SP Agent configuration file.

DESCRIPTION

The **`naviseccli`** or **`navicli snapview`** command with **`-listsnapableluns`** lists all source LUNs that you can snap.

Note: You can issue this command from either SP.

SYNTAX

```
snapview -listsnapableluns
```

EXAMPLE

For SP **ss1_spa**, this command lists all LUNs ready for snapshot copying. A sample output follows.

Note: To use this command with navicli, replace naviseccli with navicli.

```
naviseccli -h ss1_spa snapview -listsnapableluns
```

OUTPUT

The following is a sample output that shows the devices controlled by one agent. Actual output varies depending on the switches you use with the **-listsessions** command.

```
Name LUN 1

Name LUN 2

Name LUN 3

Name LUN 4

Name LUN 5

Name LUN 8

Name LUN 9

Name LUN 10

Name LUN 11

Name metaLun67
```

If the software running in the SP does not support the command, the CLI prints a `Command is not supported` error message to **stderr**.

snapview -lunpool

Lists all reserved LUNs that are currently being used with SnapView.

PREREQUISITES

For naviseccli, you must have a user account on the system on which you want to execute the command. For navicli, you must have a username/server entry in the Navisphere SP Agent configuration file.

DESCRIPTION

The **naviseccli** or **navicli snapview** command with **-lunpool** lists all information about the reserved LUNs that SnapView is currently using on the source LUNs owned by the directed SP.

SYNTAX

```
snapview -lunpool
```

EXAMPLE

This command lists all reserved LUNs on the system being used by SnapView. A sample output follows.

Note: To use this command with navicli, replace naviseccli with navicli.

```
naviseccli -h ss1_spa snapview -lunpool
```

OUTPUT

The following is a sample output that shows the devices controlled by one agent.

```
Target LUNs  AssociatedLUNPoolLUNs  LUNPoolLUNUsedPercent
4            20                    3.562500
5            21                    3.562500
1            16                    0.347900
0            17                    0.347900
```

If the software running in the SP does not support the command, the CLI prints a `Command is not supported` error message to **stderr**.

snapview -preparesnapshot

Allocates the required snapshot disk resources for an AX4-5 series system with Navisphere Express.

PREREQUISITES

- For naviseccli, you must have a user account on the system on which you want to execute the command.

- Before you can use the snapshot feature on a system with Navisphere Express, you must have at least two servers connected to the system. You cannot access the snapshot from the same server as the virtual disk. Doing so may corrupt the data on the source.
- If virtual disks are assigned to the secondary server, and this server is running AIX, HP-UX, Solaris, Linux, or NetWare, we recommend that you use the update function of the Navisphere Server Utility before you access the snapshot. By updating server information, you can determine the current device names for this server. Navisphere Express lists the device names in the Server Details page.
- You must have free space on any disk pool. Depending on the size of your source virtual disk, you must have at least 20% of the virtual disk or a minimum of one 10 GB disk.

Navisphere Express will attempt to allocate 20% of the size of the virtual disk in increments of 10 GB or a minimum of one 10 GB disk. For example, if you prepared a snapshot for a virtual disk that was 60 GB in size (20% is 12 GB), the software would allocate two 10 GB disk resources. If you prepare a snapshot for a virtual disk that is 1 GB, the software would allocate one 10 GB disk resource.

DESCRIPTION

The **naviseccli snapview** command with **-preparesnapshot** allocates the required snapshot disk resources, creates a snapshot, and adds a snapshot to a storage group.

Depending on the size of the virtual disk, this process can take some time to complete. The point-in-time copy of the virtual disk does not exist until you start the snapshot. Once you start the snapshot, and as the source server writes and modifies data on the source virtual disk, the original data (the data being modified after the copy began) is stored in the allocated disk resources for the snapshot, which preserves the point-in-time copy.

Note: In Navisphere CLI, the point-in-time copy you start and stop, is referred to as a session.

You must issue this command to the SP that owns the source LUN(s); otherwise, the command will fail.

SYNTAX

snapview -preparesnapshot *source_virtualdisk* **-hostname** *name* [**-o**]

OPTIONS

source_virtualdisk

Specifies the source virtual disk number for which you want to create a snapshot.

-hostname *name*

Specifies the server name you want to assign to the snapshot. This server is referred to as the secondary server.

-o

Allocates the required snapshot disk resources and creates the snapshot without prompting for confirmation.

EXAMPLE

For SP **ss1_spa**, this command prepares the snapshot named **mysecondaryserver**.

```
naviseccli snapview -preparesnapshot 11 -hostname mysecondaryserver
```

OUTPUT

If the version of software running on the SP does not support this command, a `Command is not supported` error message is printed to **stderr**.

snapview -rmsnapshot

Deletes a snapshot. This switch is not supported on AX4-5 series systems with Navisphere Express.

PREREQUISITES

For naviseccli, you must have a user account on the system on which you want to execute the command. For navicli, you must have a username/server entry in the Navisphere SP Agent configuration file.

DESCRIPTION

The **naviseccli** or **navicli snapview** command with **-rmsnapshot** deletes a snapshot created with the **snapview -create** function.

You can specify either the snapshot unique ID or name (if you assigned a name when you created the copy).

Note: You must issue this command to the SP that owns the source LUN(s); otherwise, the command will fail.

SYNTAX

snapview -rmsnapshot -snapshotid *uid* [**-o**] or **snapview -rmsnapshot -snapshotname** *name*
[**-o**]

OPTIONS

-snapshotid *uid*

Specifies the 32-byte unique ID of the snapshot (assigned when the copy was created with **-createsnapshot**).

-snapshotname *name*

Specifies the name of the snapshot (optionally assigned when the copy was created with **-createsnapshot**).

-o

Removes the copy without prompting for confirmation.

EXAMPLE

For SP **ss1_spa**, this command starts removing the snapshot with the name 2pmsnap. The software asks for confirmation.

Note: To use this command with navicli, replace naviseccli with navicli.

```
naviseccli -h ss1_spa snapview -rmsnapshot -snapshotname 2pmsnap

Do you really want to remove the snapshot (y/n)[N]?

y
```

OUTPUT

If the version of software running on the SP does not support this command, a `Command is not supported` error message is printed to **stderr**.

snapview -startrollback

Starts a rollback on the selected SnapView session.

PREREQUISITES

For naviseccli, you must have a user account on the system on which you want to execute the command. For **navicli**, you must have a username/server entry in the Navisphere SP Agent configuration file.

Before starting a rollback on a SnapView session, verify the following:

- The session is running in persistence mode. Navisphere CLI version 6.24 or later enables persistence mode as the default.

- The session is not in the process of being rolled back.
- The source LUN(s) is not participating in another rollback.
- If an activated snapshot is mapped to this session, unmount the snapshot.

DESCRIPTION

Note: Once you start a rollback, you cannot stop it or the session that is rolling back.

The **naviseccli** or **navicli snapview** command with **-startrollback** starts a rollback on the selected SnapView session. Rollback lets you restore the point-in-time copy of a session to the source LUN(s).

Important: Windows operating systems only - To prevent data corruption during the rollback operation, you should disable the indexing service and recycle bin on the source LUN(s) of the session you will roll back.

When you confirm the start of a rollback operation, the source LUN can instantly access the session's point-in-time data, while background copying continues (until all the session's point-in-time blocks are copied to the source LUN). You cannot start a new session on any source LUN that is participating in the rollback operation until all its background data copying has completed. The rollback operation itself does not count against the eight-session limit per source LUN.

Note: If a session spans across both SPs or if the session is a consistent session, you can issue this command from either SP; otherwise, you must issue this command to the SP that owns the source LUN(s) or the command will fail.

Rolling back with snapshots

Each source LUN belonging to a session that is rolling back can have an activated or deactivated snapshot. If the session has an activated snapshot, the software copies any server writes made to this snapshot to the source LUN. However, you must unmount the snapshot before you start the rollback operation. When the rollback operation completes, including background copying, you can remount the snapshot.

If you deactivate the snapshot prior to starting the rollback operation, any server writes made to the snapshot are lost.

Allocating reserved LUN pool space

The rollback operation itself does not use reserved LUN pool space. However, the rollback may cause copy-on-first-write operations for sessions you started after the session that is rolling back. This in turn will consume more reserved LUN pool space. These copy-on-first-write operations occur because the original point-in-time data of those sessions is being modified by the rollback operation. Additionally, since you can resume I/O to the source LUN(s) or start another session while background copying continues, you may need additional reserved LUN space.

If you run out of reserved LUNs in the SP's LUN pool while the rollback operation is in progress (during the background copying), the software will terminate the session that is rolling back after it completes all background copying. The software will also terminate any other session that tries to allocate additional reserved LUN pool space.

You cannot roll back a SnapView session if the session's source LUN(s) is:

- an unfractured clone. You must fracture the clone before rolling back the session.
- a fractured clone that is unavailable for I/O, for instance, if the clone was fractured while in an out-of-sync state.
- a clone group's source LUN that has any unfractured clone LUNs or clones that are in the process of reverse synchronizing. All clone LUNs for this source LUN must be fractured in a synchronized or consistent state before you can roll back a session to its source LUN.
- a primary image that has one or more unfractured secondary images. You must fracture the secondary image(s) before rolling back the session.
- a secondary mirror image. You must promote the secondary image and then fracture it before rolling back the session.

SYNTAX

```
snapview -startrollback sessionname [-rate high|medium|low]
[-o]
```

OPTIONS

-startrollback *sessionname*

Specifies the name for the SnapView session you want to roll back.

-rate high | medium | low

Specifies the rate at which the software copies the data back to the source LUN(s). Options are high, medium, or low. The default is medium. You can change this rate while the rollback operation is in progress (see -chgrollback on page 1051). If you do not specify the **-rate** option, the software uses the default value of medium.

-o

Executes the command without prompting for confirmation.

EXAMPLE

For SP **ss1_spa**, this command starts rolling back the session named rollbackTest. The specified rollback rate is low. The software asks for confirmation.

Note: To use this command with navicli, replace naviseccli with navicli.

```
naviseccli -h ss1_spa snapview -startrollback rollbackTest -rate low

This session has at least one active snapshot associated
with it. Continuing this operation will restore not just the original
data but also any modifications made to the active snapshot LUNs. If
only the original data is desired for the RollBack, then quit this operation

and deactivate the snapshot first.

Make sure that you have quiesced all host I/O to the
Session's source LUNs and to any of the associated active Snapshot LUNs.
This command will flush the Session's data back to the Source LUNs
asynchronously
in the background.

NOTE: If you want a recovery session for this rollback,
you must create a persistent session NOW before beginning the rollback.
Otherwise you will not be able to recover the current data once rollback
begins.

Do you want to continue? (y/n)?
```

OUTPUT

If the version of software running on the SP does not support this command, a `Command is not supported` error message is printed to **`stderr`**.

snapview -startsession

Starts a SnapView session in persistence mode, and optionally in consistent mode.

PREREQUISITES

For naviseccli, you must have a user account on the system on which you want to execute the command. For navicli, you must have a username/server entry in the Navisphere SP Agent configuration file.

Before starting a SnapView session, verify the following:

- You configured the reserved LUN pool by using the reserved **`-lunpool -addlun`** function.
- The source LUNs are currently not being used to start another consistent session. Once the consistent session starts on all the source LUNs, you can start another consistent session using the same source LUNs.
- If MirrorView/Asynchronous is installed, the source LUNs that you will use to start the consistent session cannot be in the process of starting an update to a group. If they are, you may receive an error when you attempt to start the consistent session. Once the mirror or group is updating or has been updated and before the next update occurs, you can start the consistent session using the same source LUNs.

DESCRIPTION

Note: With Navisphere CLI version 6.24 or later, all SnapView sessions run in persistence mode, so the **-persistence** switch is no longer required.

The **naviseccli** or **navicli snapview** command with **-startsession** starts a SnapView session on the specified source LUN(s). A SnapView session is a point-in-time copy of a source LUN. The session keeps track of how the source LUN looks at a particular point in time. You start a session using the snapshot name, snapshot unique ID (snapshot WWN), or the source LUN's number.

With Navisphere CLI version 6.24 or later, all SnapView sessions run in persistence mode, which means that the session will survive SP reboot or failure, software installation, system reboot or power failure, and server I/O trespassing to the peer SP. You can also run a session in consistent mode using the **-consistent** option, which will preserve the point-in-time restartable copy across a set of source LUNs.

Note: When you start a session, SnapView automatically allocates and retains additional memory. This additional memory counts against the total replication software memory budget.

After you start a SnapView session and as the production server writes to the source LUN(s), the software stores a copy of the original data in the reserved LUN pool in chunks. This copy is referred to as copy-on-first-write and occurs only once, which is when the server first modifies a data chunk on the source LUN(s).

Note: If a session spans across both SPs or if the session is a consistent session, you can issue this command from either SP; otherwise, you must issue this command to the SP that owns the source LUN(s) or the command will fail.

SYNTAX

snapview -startsession *sessionname* **-snapshotid** *uids* | **-snapshotname** *names* | **-lun** *luns* [**-consistent**] **-persistence**

OPTIONS

-startsession *sessionname*

Specifies the name of the session to be started. A session name can have as many as 32 characters. A name is required. If you use spaces in the name, enclose the entire name string in quotation marks in this command and in other CLI commands that access the session.

-snapshotid *uid*

Specifies one or more snapshot 32-byte unique IDs (WWNs). The snapshot software assigns a unique ID to the snapshot when you create it with **-createsnapshot** . For multiple IDs, separate IDs with blanks. For any letters in the ID, you must specify the same case as the software assigned to the image when the snapshot was created (use the snapview **-listsnapshots** function).

-snapshotname *names*

Specifies one or more snapshot names that you assigned when you created the snapshot with **-createsnapshot**. For multiple names, separate the names with commas.

-lun *luns*

Specifies one or more source LUN numbers. For multiple LUNs, separate the numbers with blanks.

[-consistent]

Note: For AX4-5 series systems, this switch is supported only if both the Unisphere and SnapView enablers are installed. For AX series systems, this switch is not supported.

Specifies a consistent session. The session will preserve the point-in-time restartable copy across a set of source LUNs. The SnapView driver will delay any I/O requests to the set of source LUNs until the session has started on all LUNs (thus preserving the point-in-time restartable copy on the entire set of LUNs).

Note: A restartable copy is a data state having dependent write consistency and where all internal database/application control information is consistent with a database management system/application image.

If the session spans both SPs you must specify only one SP and the software will start the session on both SPs. Once you start a consistent session, you cannot add another source LUN to the session. In the event of a failure, the software will not start the session on any source LUN and will display an error message.

You would use consistent mode if any of the following is true:

- You want a consistent replica across a set of LUNs.
- You do not want to stop I/O to the source LUN(s) before starting a session.
- You want to prevent other LUNs from being added to the session. If desired, you can start a consistent session on a single source LUN to prevent other LUNs from being added to the session.
- The set of source LUNs that you will use to start the session spans both SPs; however, the source LUNs cannot span systems.

The consistent feature is available on a per-session basis (not per snapshot or source LUN) and counts as one of the eight sessions per source LUN limit.

Note: When a consistent session is in the process of starting on all LUNs, you cannot stop the session (the software may stop the session immediately after the start completes if I/O is queued and there is not enough space in the reserved LUN pool), perform a rollback operation, or activate a snapshot to the session.

-persistence

Note: With Navisphere CLI version 6.24 or later, all SnapView sessions run in persistence mode, so the **-persistence** switch is no longer required. If you have an AX4-5 or AX series system and are running a CLI version prior to 6.24, you must specify the **-persistence** switch or an error message will be displayed.

Specifies a persistent session. The session will survive SP reboot or failure, software installation, system reboot or power failure, and server I/O trespassing to the peer SP.

The persistence feature is available on a per-session basis (not per snapshot or source LUN). In the event of a failure, reserved LUNs along with the source LUNs will trespass to the other SP. Depending on your failover software, once the failed SP is running, you may need to issue a restore command in order to restore the proper source LUNs and reserved LUNs back to their original SP. For the appropriate restore command, refer to the documentation that shipped with your failover software.

Note: For information on supported failover software for the system you are managing, refer to the release notes for SnapView and admsnap.

EXAMPLE

In the first example, the **-startsession** command starts a persistent session named **2pmsession**. In the second example, the **-startsession** command starts a persistent and consistent session named **2pmsession** on LUNs one, two, and three. If the session spans both SPs you need to specify only one SP and the software will start the session on both SPs.

Note: To use this command with navicli, replace naviseccli with navicli.

```
naviseccli -h ss1_spa snapview -startsession 2pmsession

naviseccli -h ss1_spa snapview -startsession 2pmsession -persistence
```

OUTPUT

If the version of software running on the SP does not support this command, a `Command is not supported` error message is printed to **stderr**.

POSTREQUISITES

After you start a SnapView session, a secondary server can then activate (map) a snapshot to the SnapView session. The snapshot views the original source LUN data chunks that have been modified since you started the session from the reserved LUN pool and unmodified data chunks from the source LUN(s).

snapview -stopsession

Stops a SnapView session.

PREREQUISITES

For naviseccli, you must have a user account on the system on which you want to execute the command. For navicli, you must have a username/server entry in the Navisphere SP Agent configuration file.

DESCRIPTION

The **naviseccli** or **navicli snapview** command with **-stopsession** stops the specified session and frees the reserved LUN pool space used by the session.

If the snapshots participating in the session belong to one or more storage groups and you stop the session, the servers connected to the storage groups will no longer have access to the snapshots in those storage groups. EMC recommends that you do one of the following:

- Flush the I/O on the server viewing the active snapshot before stopping the session.
- Deactivate the snapshot before stopping the session.

Stopping a session with an active snapshot makes the snapshot appear inactive.

Note: If a session spans across both SPs or if the session is a consistent session, you can issue this command from either SP; otherwise, you must issue this command to the SP that owns the source LUN(s) or the command will fail. If you started a session on multiple source LUNs, you can select any of the source LUNs to stop the session.

SYNTAX

snapview -stopsession *sessionname* [**-o**]

OPTIONS

-stopsession *sessionname*

Specifies the name of the session to be stopped. Someone must have assigned the name when the snapshot was created or when the session was started.

-o

Stops the session without asking for confirmation.

EXAMPLE

For SP **ss1_spa**, this command stops the session named **2pmsession**. The software asks for confirmation:

Note: To use this command with navicli, replace naviseccli with navicli.

```
naviseccli -h ss1_spa snapview -stopsession 2pmsession

Stopping of the session will stop data SnapView. Do you really want to stop
 the session (y/n)[n]?

y
```

OUTPUT

If the version of software running on the SP does not support this command, a `Command is not supported` error message is printed to **stderr**. Other errors:

`INVALID_SESSION` Session does not exist.

POSTREQUISITES

What next?

For a step-by-step overview and examples on setting up and using snapshots with admsnap and the CLI, refer to SnapView examples on page 1103.

Admsnap commands for snapshots

This section explains how to use the admsnap utility software with SnapView snapshots.

Note: Scripts that run from Windows 2000 servers will not support the complete set of CX4 features. Refer to the ESM for more detailed information. The clone feature is supported only on CX4 series, CX3 series, CX series, and AX4-5 series with Navisphere Manager/Unisphere enabler and the SnapView enabler installed.

About admsnap software and snapshots

The admsnap utility is an executable program that you can run interactively or with a script to manage snapshots. The admsnap utility resides on the servers connected to the system with the SnapView driver. You must execute the following admsnap commands from one of these attached servers:

- **`admsnap activate`** – activates a snapshot to a session.
- **`admsnap deactivate`** – deactivates a snapshot from a session.
- **`admsnap flush`** – flushes cached data to the LUN.
- **`admsnap list`** – lists all current snapshots.
- **`admsnap start`** – starts a session.
- **`admsnap stop`** – stops a session.

Note: The admsnap software supports native device names and PowerPath pseudo-device names. If you use a PowerPath pseudo-device name, you can add this device name to the `etc/fstab` file (for Linux) or to the `etc/vfstab` file (for Solaris). Admsnap supports both device naming scheme and enclosure naming scheme for Veritas.

For a step-by-step overview and examples of setting up and using snapshots with admsnap and Navisphere CLI, refer to SnapView examples on page 1103.

Reserved LUN pool (snapshot cache)

With SnapView version 02.03.xxx (or higher), the snapshot cache is referred to as the reserved LUN pool. The reserved LUN pool and the snapshot cache work with SnapView in the same way. However, unlike the snapshot cache, which was used solely for SnapView, the reserved LUN pool shares its LUN resources with other applications such as SAN Copy and MirrorView/Asynchronous. Navisphere CLI snapshot cache commands are still supported; however, EMC recommends that you use the new reserved LUN pool commands. For information on the new reserved LUN pool commands, refer to the latest revision of the *EMC Navisphere Command Line Interface (CLI) Reference*.

For reserved LUN pool information that is specific to SnapView, refer to fSnapView command functions on page 1048.

Requirements for snapshots

Before you can use admsnap for snapshots, the following must be true:

General requirements

- A connected server must be running a suitable web browser to run Navisphere CLI (and optionally the Unisphere). CLI is needed to configure and maintain the reserved LUN pool.
- The system must have the SnapView software enabled.
- The production and secondary servers must have both the Unisphere Host Agent and admsnap software installed. To install the host agent and admsnap, refer to the EMC Block server support products guide for your operating system.
- A reserved LUN must be available for each source LUN(s) for which you will start a session; otherwise an admsnap start command will fail. You can bind a reserved LUN and add it to an SP's reserved LUN pool using Navisphere CLI or Unisphere.

Platform/server-specific requirements

- For HP-UX, admsnap requires a volume group entry for each path to the system. The entry or entries can be contained in a single volume group or multiple volume groups. On the secondary server, the volume group entry or entries must specify a snapshot LUN.
- For UNIX, if a session is unexpectedly stopped (due to SP panic or path failure), the secondary server must unmount the inactive snapshot or reboot the secondary server in order for this server to disregard the session's point-in-time data.
- For Windows, you may have to reboot the secondary server the first time you add the snapshot to the server's storage group.
- If you have a VMware ESX Server, you must activate the snapshot before you add the snapshot to a storage group. Refer to the Overview of setting up SnapView to use snapshots on page 1046 for additional information.

admsnap activate

Allows an attached server to access a snapshot.

PREREQUISITES

You must have administrative privileges on the secondary server.

DESCRIPTION

From the secondary server, the **activate** command scans system buses for system devices and determines if any device is part of a SnapView session.

When a secondary server activates (maps) a snapshot to a session, this server can write to the snapshot. The software stores all writes made to the snapshot in the reserved LUN pool. If the secondary server deactivates the snapshot from the session, the software destroys all writes.

Note: If you failed to flush the file system buffers before starting the session, the snapshot may not be usable.

You can activate only one session to a snapshot. To list current sessions use the CLI command **navicli snapview -listsessions**.

Note: The Navisphere CLI **snapview -activatesnapshot** command serves a similar function to the **admsnap activate** command, but does not return snapshot device information as admsnap does or allow you to activate all snapshots using one command. You must issue the **admsnap activate** command from the secondary server (the server that will access the snapshot).

Depending on your operating system, the **admsnap activate** command will do the following:

Server OS	Function description
Windows	Returns the snapshot drive letter. You can use this drive immediately. If the activated snapshot has multiple volumes or partitions, admsnap will assign a drive letter to each volume or partition. If the volume is a dynamic drive, admsnap will activate all the physical drives but will not assign a drive letter. Additional steps will be required to bring the volume online and to assign the drive letter. If the given session is on multiple physical disks and each physical disk has its own volume, then each volume will be assigned a drive letter. If no drive letters are available, then admsnap will activate only one physical disk and an error appears through the command line. For Windows Remote Desktop and Terminal Services - If a terminal server is running on the secondary server, you must remove and disable it before using the **`activate`** command. If you have the terminal server enabled, it prevents the **`activate`** command from working properly.
AIX, HP-UX, Linux, and Solaris	Returns the snapshot device name. You will need to run **`fsck`** on this device only if it contains a file system and you did not unmount the source LUN(s) when you started the session. Then, if the source LUN(s) contains a file system, mount the file system on the secondary server using the snapshot device name to make the file system available for use.
NetWare	Returns the snapshot device name. You will then need to run the Scan for new devices command or scan all LUNs command on the console. After running one of the scan commands, you can mount the volume associated with this device name to make a file system available.

SYNTAX

```
admsnap activate [-h] -s session_name
[-o object_name]
[-t object_type]
|
[-d driveletter]
[-r 0 |-r 1]
[-c rescan_count]
```

OPTIONS

[-h]

Lists the help output for a given operation. If you use this option on the command line, a help message will be displayed for each option you specify. Admsnap will not perform the command; it lists the help output only.

This option is valid for Windows, Solaris, HP-UX, Linux, and AIX systems.

-s *sessionname*

Specifies the session name that you assigned when you started the session. This is a string of up to 256 characters, and can be composed of letters, numbers and underscores.

The session name is case sensitive and must be unique on the system. If the session name contains spaces, you must enter the name in double quotation marks (for example, "**June 21st Session**").

[-o *object_name***]**

Specifies an object name that you want to activate. You should use this option only when admsnap can determine the snapshot device list for the specified object name.

In UNIX, the objects that are generally available for this option are the raw UNIX device names and the EMC PowerPath device names. In Windows, the objects that are generally available for this option are the raw Windows device names.

If you omit this switch, the software searches all devices for the appropriate device, which takes time. You cannot use this option with the **-d** option. If you use the **-t** option, the device name must be a valid name for the type of object specified with the **-t** option.

The table below lists the supported object names for your operating system.

Operating system	Supported object name(s)
Windows	◆ Drive letter[a] ◆ Physical drive name
AIX, HP-UX, Linux, NetWare, and Solaris	◆ Device name ◆ File system name[b]

[-t object_type]

Specifies the object type. Valid Windows object types are device, file system, volume, and drive letter. Valid UNIX object types are device, volume, and file system. If the object type name contains spaces, enter the name without spaces.

[a] The **admsnap activate** command does not allow the use of drive letters A:, B:, C:, or D: with the **-o** option.

[b] If the object name is a file system, then admsnap will parse the file system table entry to get the device name and will attempt to activate the snapshot for that device.

If you do not specify an object type, admsnap will attempt to determine the correct object type among the valid object types and report a failure if it cannot.

You should use the **-t** option when the argument for the **-o** option is not in a standard and recognizable form for your operating system's object or device. This means if you specify a valid argument for the **-o** option, you do not need the **-t** option for any operating system drive letter, file system, Veritas volume, or PowerPath pseudo-device names. For example, on Solaris systems, admsnap determines the **-o** argument of /dev/rdsk/cXdXtXsX to be a Solaris native device name, so you do not need to specify the **-t** device.

You cannot use this option in conjunction with the **-d** option.

[-d driveletter]

Specifies the drive letter you want to assign to the snapshot device, and if available, admsnap will assign the specified drive letter to the snapshot device. If the operation resulted in more than one device being activated, then all devices are activated but only the first device is assigned the drive letter.

Note: The **admsnap activate** command does not allow the use of drive letters A:, B:, C:, or D: with the **-d** option.

This option is valid on Windows systems only. All other operating systems ignore this option. You cannot use this option in conjunction with the **-o** or **-t** options.

[-r 0 | -r 1]

Specifies whether to perform a rescan of the operating system devices before performing the **activate** operation. The default rescanning behavior (when the **-r** option is not present on the command line) depends on whether you specify an object name with the **-o** option. If you do specify the object name, the default is not to perform a rescan. If you do not specify the object name, the default is to perform a rescan, which may take some time because it will rescan every device on the operating system.

When you use the **-r [0|1]** option, it overrides any default behavior.

This option is valid on Windows, Solaris, HP-UX, and Linux systems only. All other operating systems ignore this option.

[-c *rescan_count***]**

Specifies the number of rescans for devices on the operating system. A rescan count occurs after a successful activate operation to bring the snapshot devices online. If you specify a count of 0, admsnap will not perform a rescan; however, the device could activate successfully on the system but will not be online with the server. If you omit the **-c** option, then a default value of 1 is set.

This option is valid on Windows only. All other operating systems ignore this option.

EXAMPLE

Windows example:

```
admsnap activate -s session1 -d e:
```

admsnap deactivate

Allows the secondary server to remove access to a snapshot and destroys any writes the secondary server made to the snapshot.

PREREQUISITES

You must have administrative privileges on the secondary server.

DESCRIPTION

The **admsnap deactivate** command unmaps a snapshot LUN from a SnapView session by removing access to the snapshot device from the secondary (backup) server. The deactivated snapshot goes offline and thereby becomes inaccessible to the secondary server.

Use this command on the secondary (backup) server after the session has been activated and you no longer require the snapshot device.

Note: The Navisphere CLI **snapview -deactivatesnapshot** command has a similar function as the **admsnap deactivate** command, but does not remove the snapshot device information from the server. You must issue the **admsnap deactivate** command from the secondary server (the server that activated it).

When the secondary server deactivates the snapshot from the session, admsnap destroys all writes made to the snapshot.

Depending on your operating system, the **admsnap deactivate** command will do one of the following:

Server OS	Function description
Windows	Flushes all buffers and removes the drive letter assigned with admsnap activate. The snapshot goes inactive and continued I/O is not possible. This command lets you avoid rebooting the secondary server between activates. If the deactivated snapshot has multiple volumes or partitions, admsnap will remove a drive letter from each volume or partition. If the volume is a dynamic drive, admsnap will de-activate all the physical drives but will not remove the drive letter. Additional steps will be required to bring the volume offline and to remove the drive letter. If the given session is on multiple physical disks and each physical disk has its own volume, then the drive letter on each volume will be removed. For Windows Remote Desktop and Terminal Services - If a terminal server is running on the secondary server, you must remove and disable it before using the **deactivate** command. If you have the terminal server enabled, it pre-vents the **deactivate** command from working properly.
AIX, HP-UX, Linux, and Solaris	Removes access to the snapshot but does not flush buffers. Before you deactivate the snapshot, you must unmount the file system by issuing the **umount** command to flush all buffers. If you are unable to unmount the file system, you can issue the admsnap **flush** command.[a]
NetWare	Removes access to the snapshot but does not flush buffers. Before you deactivate the snapshot, you must use the **dismount** command on the volume to dismount the file system. This will flush all buffers.

SYNTAX

admsnap deactivate [-h] -s *session_name* [**-o** *object_name* [**-t** *object_type*]] [**-f**]

[a] The **flush** command is not considered a substitute for unmounting the file system; it only complements unmounting the file system.

OPTIONS

[-h]

Lists the help output for a given operation. If you use this option on the command line, a help message is displayed for each option you specify. Admsnap will not perform the command; it lists the help output only.

This option is valid for Windows, Solaris, HP-UX, Linux, and AIX systems.

-s *sessionname*

Specifies the session name that you assigned when you started the session. This is a string of up to 256 characters, and can be composed of letters, numbers and underscores.

The session name is case sensitive and must be unique on the system. If the session name contains spaces, you must enter the name in double quotation marks (for example, `"June 21st Session"`).

The name you specify must be a valid session name for an active SnapView session started from a production server and activated on the secondary (or backup) server that is performing the deactivate operation. All snapshots with the given session name will be deactivated.

On Windows systems, if the activated LUN with the given session name has multiple volumes and the system assigned drive letters, then admsnap will delete each drive letter, dismount the volumes, and then set the volumes offline before deactivating the LUN. If multiple LUNs have the same given session, then admsnap deletes the drive letters for all volumes and sets the volumes offline before deactivating the LUNs.

On UNIX servers, admsnap only deactivates the devices and no other operations are performed before deactivating the device.

[-o *object_name*]

Specifies an object name. When you execute the **admsnap deactivate** command with a device name as an object name, admsnap attempts to deactivate the snapshot on that device with the given session name. If the session name does not exist on the device, admsnap will report an error.

If you specify an object name that contains multiple devices, admsnap will deactivate the session on all the LUNs that make up those devices.

If you use the **-t** option, the device name must be a valid name for the type of object specified with the **-t** option.

The table below lists the supported object names for your operating system.

Operating system	Supported object name(s)
Windows	◆ Drive letter[a] ◆ Physical drive name
AIX, HP-UX, Linux, Solaris, or NetWare	◆ Device name ◆ File system name[b] ◆ Powerpath device ◆ Device name (Legacy and agile) ◆ Veritas volume (Device and enclosure) ◆ Linux MPIO's mpath device

[-t *object_type***]**

Specifies the object type. This option is valid only when the **-o** option is given. Valid Windows object types are device, file system, volume, and drive letter. Valid UNIX object types are device, volume, and file system. If the object type name contains spaces, enter the name without spaces.

If you do not specify an object type, admsnap will attempt to determine the correct object type among the valid object types and report a failure if it cannot.

This switch is supported on Windows or Solaris operating systems only.

[-f]

You can use this option to force a deactivate operation on a physical device name that does not have a drive letter assigned.

EXAMPLE

Windows example: Example of a fully qualified pathname to a Veritas volume named scratch:

```
admsnap deactivate -s session1 -o e:

Example of a fully qualified pathname to a raw Veritas device name:

admsnap deactivate -o /dev/xv/dsk/scratchdg/scratch

admsnap deactivate -o /dev/vx/rdmp/c1t0d0s2
```

[a] The **admsnap activate** command does not allow the use of drive letters A:, B:, C:, or D: with the **-o** option.

[b] If the object name is a file system, then admsnap will parse the file system table entry to get the device name and will attempt to activate the snapshot for that device.

admsnap flush

Flushes all data that has been written to the source LUN.

PREREQUISITES

You must have administrative privileges on the production server.

DESCRIPTION

The **admsnap flush** command flushes all data.

Use it on the production server before starting a SnapView session to ensure that all cached data has been written to disk. Also, use the **flush** command on the secondary server before issuing a **deactivate** command to ensure that all data has been written.

Depending on your operating system, the **admsnap flush** command will do the following:

Server OS [a]	Function description
Windows	Writes the data from the buffers to the disk.
AIX, HP-UX, Linux, and Solaris	Writes the data from the buffers to the disk. We recommend that you unmount the file system by issuing the **umount** command to ensure that no additional source writes are in process. If you are unable to unmount the file system, you can issue the admsnap **flush** command[b].
NetWare	The **flush** command is not supported. Dismount the file system by using the **dismount** command on the volume.

SYNTAX

```
admsnap flush [-h] -o object_name
[-t object_type]
```

[a] With some operating systems, you may need to shut down the application to flush the data. Specific operating systems have different requirements.

[b] Neither the **flush** command nor the **sync** command is a substitute for unmounting the file system. Both commands only complement unmounting the file system.

OPTIONS

[-h]

Lists the help output for a given operation. If you use this option on the command line, a help message is displayed for each option you specify. Admsnap will not perform the command; it lists the help output only.

This option is valid for Windows, Solaris, HP-UX, Linux, and AIX systems.

-o *object_name*

Specifies an object name. If you use the **-t** option, the device name must be a valid name for the type of object specified with the **-t** option.

The table below lists the supported object names for your operating system.

Operating system	Supported object name(s)
Windows	◆ Drive letter ◆ Physical drive name
HP-UX[a], Solaris	◆ Device name ◆ File system name[b] ◆ Veritas volume name[c]
Linux	◆ Device name ◆ File system name[b] ◆ Veritas volume name[c]
AIX[a]	◆ Device name ◆ File system name[b]

[a] If the object name is on a Logical Volume Manager, then admsnap will parse the Logical Volume Manager (LVM) to get the device names and will attempt to flush those devices.

[b] If the object name is a file system, then admsnap will parse the file system table entry to get the device name and will attempt to flush that device.

[c] If the object name is a Veritas volume name, admsnap will parse the Veritas volume to determine all physical disks for the volume and will attempt to flush each physical disk.

[-t *object_type*]

Specifies the object type. This switch is supported on Windows or Solaris operating systems only. Valid Windows object types are device and drive letter. Valid Solaris object types are device, volume, and file system. If the object type name contains spaces, enter the name without spaces.

If you do not provide an object type, admsnap will attempt to determine the correct object type from the supported types and report a failure if it cannot.

You should use the **-t** option when the argument for the **-o** option is not in a standard and recognizable form for your operating system's object or device. This means if you specify a valid argument for the **-o** option, you do not need to specify the **-t** option for any operating system drive letter, file system, Veritas volume, or native or PowerPath pseudo-device names. For example, on Solaris systems, admsnap determines the **-o** argument of /dev/rdsk/cXdXtXsX to be a Solaris native device name, so you do not need to specify the **-t** device.

EXAMPLE

Windows example:

```
admsnap flush -o e:
```

admsnap list

Performs a list operation and provides the World Wide Name (WWN) of all supported devices on the system.

PREREQUISITES

You must have administrative privileges on the production and secondary server.

DESCRIPTION

The **admsnap list** command will attempt to list devices and their World Wide Names (or WWN) on the operating system. You can use the WWN to distinguish one operating system device from another.

The WWN is a worldwide unique string that the system provides for its devices. Use the WWN to uniquely identify those devices on the server. Use this operation to match the server's devices with the devices the server sees on the system.

This command is supported on Windows, Solaris, HP-UX, Linux, and AIX operating systems only.

SYNTAX

```
admsnap list [-h]
[-l lun_wwn]
[-d object_name]
[-a output_format]
```

OPTIONS

[-h]

Lists the help output for a given operation. If you use this option on the command line, a help message is displayed for each option you specify. Admsnap will not perform the command; it lists the help output only.

This option is valid for Windows, and Solaris systems only.

[-l *lun_wwn*]

Lists the WWN of all supported devices on the system. The WWN must use a valid WWN format.

This option is valid for Windows Server 2003, Windows 2000, and Solaris systems only.

[-d *object_name*]

Specifies an object name. On Windows systems, the **-a** option is ignored when used with the **-d** option and the object name argument is a Windows physical device name, for example: \\.\PhysicalDrive1.

The table below lists the supported object names for your operating system.

Operating system	Supported object name(s)
Windows	◆ Drive letter ◆ Physical drive name
HP-UX[a], Linux, NetWare, and Solaris	◆ Device name (Legacy and agile) ◆ File system name[b] ◆ Veritas volume name (Device and enclosure)[c] ◆ Powerpath device
AIX[a]	◆ Device name ◆ File system name[b] ◆ Powerpath device
Linux	◆ Device name ◆ File system name ◆ Powerpath device ◆ Linux MPIO's mpath device ◆ Veritas volume (Device and enclosure)
Netware	◆ Device name
Solaris	◆ Device name ◆ File system name ◆ Powerpath device ◆ Veritas volume (Device and enclosure)

[a] If the object name is on a Logical Volume Manager, then admsnap will parse the Logical Volume Manager (LVM) to get the device names and will attempt to flush those devices.

[b] If the object name is a file system, then admsnap will parse the file system table entry to get the device name and will attempt to flush that device.

[c] If the object name is a Veritas volume name, admsnap will parse the Veritas volume to determine all physical disks for the volume and will attempt to flush each physical disk.

[-a *output_format*]

Specifies an alternative output style on a Windows server. The default Windows output style is to list the drive letter or physical drive and its WWN. Valid output formats are drive letter (default if **-a** is not specified at all) or physical drive. If the output format contains spaces, enter it without spaces.

Admsnap will ignore the **-a** option when you specify the **-d** option and the object name argument is a Windows device name, for example \\.\PhysicalDrive1.

EXAMPLE

Windows example:

```
admsnap list -d \\.\PhysicalDrive1
```

admsnap start

Starts a point-in-time copy of a source LUN.

PREREQUISITES

You must have administrative privileges on the production server.

DESCRIPTION

The **admsnap start** operation starts a SnapView persistent session with the specified session name. A persistent session survives SP failures, software installation upgrades, and event trespasses.

Note: Admsnap version 2.24 or later enables all SnapView sessions to run in persistence mode as the default.

From the production server, the **start** command specifies systems that have a LUN or file system you want to copy, then it begins the point-in-time copy of the specified source.

Note: Before you start a SnapView session, admsnap requires that you create a snapshot using the **-createsnapshot** command.

The **admsnap start** command is valid on Windows, Solaris, HP-UX, Linux, NetWare, and AIX systems.

SYNTAX

admsnap start [**-h**] **-s** *session-name* **-o object-name** *object-name* [**-t** *object_type*] **-p -c**

OPTIONS

[-h]

Lists the help output for a given operation. If you use this option on the command line, a help message is displayed for each option you specify. Admsnap will not perform the command; it lists the help output only.

This option is valid for Windows, Solaris, HP-UX, Linux, and AIX systems.

-s *session_name*

Specifies the session name that you assigned when you started the session. This is a string of up to 256 characters, and can be composed of letters, numbers and underscores.

The session name is case sensitive and must be unique on the system. If the session name contains spaces, you must enter the name in double quotation marks (for example, "June 21st Session").

Note: If you issue multiple start operations from the production server (this includes other production servers) using the same session name, the session will consist of all the LUNs that make up those devices. This operation can be called multiple times (even from different servers or EMC Navisphere) with the same session name and the result is that the new objects are added into the existing session.

-o *object_name*

Specifies an object name. You must specify an object name to identify the session. If you specify a device name or a drive letter, the LUN(s) you specify may have multiple partitions; if so, the snapshot will consist of all partitions on that LUN(s).

If you use the **-t** option, the device name must be a valid name for the type of object specified with the **-t** option.

Note: Admsnap version 2.1 with a Windows, or UNIX server - If you specify an object name that spans multiple devices with the **admsnap start** command, and one of those devices fails to start, admsnap will stop the session on all the devices. For example, you start a session on a Solaris file system and that file system spans across two LUNs on the system. The first device successfully starts the session but the second does not. The admsnap software will stop the first session started on the device, and then you must restart the session on the file system after you have corrected the cause of the failure.

The table below lists the supported object names for your operating system.

Operating system	Supported object name(s)
Windows	◆ Drive letter ◆ Physical drive name
HP-UX[a], Linux, NetWare, and Solaris	◆ Device name ◆ File system name[b] ◆ Veritas volume name (Device and enclosure)[c] ◆ Powerpath device ◆ Linux MPIO's mpath device
AIX[a]	◆ Device name ◆ File system name[b] ◆ Powerpath device

[-t *object_type***]**

Specifies the object type. This switch is valid on Windows and UNIX operating systems only. Valid Windows object types are device and drive letter. Valid Solaris object types are device, volume, and file system. If the object type name contains spaces, enter the name without spaces.

You should use the **-t** option when the argument for the **-o** option is not in a standard and recognizable form for your operating system's object or device.

If you do not specify the **-t** option, admsnap will attempt to determine the correct object type and report a failure if it cannot.

[-c]

Specifies a consistent session. The session will preserve the point-in-time copy across a set of source LUNs. The SnapView driver will delay any I/O requests to the set of source LUNs until the session has started on all LUNs (thus preserving the point-in-time on the entire set of LUNs). Once you start a consistent session, you cannot add another source LUN to the session. In the event of a failure, the software will not start the session on any source LUN and will display an error message.

[b] If the object name is a file system, then admsnap will parse the file system table entry to get the device name and will attempt to start the session on that device.

[c] If the object name is a Veritas volume name, admsnap will parse the Veritas volume to determine all physical disks for the volume and will attempt to start the session on each physical disk.

[a] If the object name is on a Logical Volume Manager, then admsnap will parse the Logical Volume Manager (LVM) to get the device names and will attempt to start the session on those devices.

Note: When starting a consistent session, multiple object names must be separated by a comma with no spaces. If desired, you can specify different object names. For examples, refer to SnapView examples on page 1103.

You would use consistent mode if:

- you cannot stop I/O to the source LUN(s) before starting a session.
- you want to prevent other LUNs from being added to the session. If desired, you can start a consistent session on a single source LUN to prevent other LUNs from being added to the session.
- the set of source LUNs that you will use to start the session spans both SPs; however, the source LUNs cannot span systems.

The consistent feature is available on a per-session basis (not per snapshot or source LUN) and counts as one of the eight sessions per source LUN limit.

Note: While a consistent session is in the process of starting on all LUNs, you cannot stop the session (the software may stop the session immediately after the start completes if I/O is queued and there is not enough space in the SP's reserved LUN pool), perform a rollback operation, or activate a snapshot to the session.

-p

Specifies a persistent session. If you use this option, the session will run in persistence mode and will survive SP failures, software installation upgrades, and trespass events. With admsnap version 2.24 or later, all SnapView sessions run in persistence mode, so the **-p** switch is no longer required.

If you have an AX4-5 or AX series system and are running an admsnap version prior to 2.24, you must specify the **-p** switch or an error message will be displayed.

EXAMPLE

Windows examples:

```
admsnap start -s session1 -o \\.\PhysicalDrive1

admsnap start -s session1 -o \\.\PhysicalDrive1,PhysicalDrive2,PhysicalDrive3
 -c

admsnap start -s session1 -o F:,G:,H:,I -c -p

admsnap start -s session1 -o F:,G:,\\.\PhysicalDrive1,PhysicalDrive2 -c
UNIX examples:

admsnap start -s session1 -o /mnt/fs1 -p

admsnap start -s session1 -o /mnt/fs1,/mnt/fs2,/mnt/fs3 -c
```

```
admsnap start -s session1 -o /dev/sda,/dev/sdc,/dev/sdd -c -p

admsnap start -s session1 -o /dev/sda,/mnt/fs2,vol_name -c
```

admsnap stop

Stops the point-in-time copy of a source LUN.

PREREQUISITES

You must have administrative privileges on the production server.

DESCRIPTION

The admsnap stop operation stops a SnapView session. From the production server that owns the source LUN, the **stop** command stops a SnapView session, freeing the reserved LUN and disk space the session used.

The **admsnap stop** command is valid on Windows, Solaris, HP-UX, Linux, NetWare, and AIX systems.

Note: If you started a session on multiple source LUNs, you can select any of the source LUNs to stop the session.

SYNTAX

```
admsnap stop [-h] -s session-name -o object_name
[-t object_type]
```

OPTIONS

[-h]

Lists the help output for a given operation. If you use this option on the command line, a help message is displayed for each option you specify. Admsnap will not perform the command; it lists the help output only.

This option is valid for Windows, Solaris, HP-UX, Linux, and AIX systems.

-s *session_name*

Specifies the session name that you assigned when you started the session. You must specify the session name you used when you started the session. This is a string of up to 256 characters, and can be composed of letters, numbers and underscores.

The session name is case sensitive and must be unique on the system. If the session name contains spaces, you must enter the name in double quotation marks (for example, "June 21st Session").

-o *object_name*

Specifies an object name. You must specify an object name to identify the session.

If you use the **-t** option, the device name must be a valid name for the type of object specified with the **-t** option.

The table below lists the supported object names for your operating system.

Operating system	Supported object name(s)
Windows	◆ Drive letter ◆ Physical drive name
HP-UX[a], Linux, NetWare, and Solaris	◆ Device name ◆ File system name[b] ◆ Veritas volume name (Device and enclosure)[c] ◆ Powerpath device ◆ Linux MPIO's mpath device
AIX[a]	◆ Device name ◆ File system name[b]

The only time admsnap will not stop the session on all devices within an object is when the device is also in another object that already has the same session name started.

[-t *object_type***]**

Specifies the object type. This switch is valid on Windows or UNIX operating systems only. Valid types on Windows are device and drive letter. Valid types on Solaris are device, volume, and file system. If the object type name contains spaces, enter the name without spaces.

You should use the **-t** option when the argument for the **-o** option is not in a standard and recognizable form for your operating system's object or device. If you do not specify the **-t** option, admsnap will attempt to determine the correct object type and report a failure if it cannot.

EXAMPLE

Windows example:

```
admsnap stop -s session1 -o \\.\PhysicalDrive1
```

[b] If the object name is a file system, then admsnap will parse the file system table entry to get the device name and will attempt to start the session on that device.

[c] If the object name is a Veritas volume name, admsnap will parse the Veritas volume to determine all physical disks for the volume and will attempt to start the session on each physical disk.

[a] If the object name is on a Logical Volume Manager, then admsnap will parse the Logical Volume Manager (LVM) to get the device names and will attempt to start the session on those devices.

SnapView examples

This section contains SnapView examples, from setting up clones and snapshots (with Navisphere CLI) to using them (with admsnap and Navisphere CLI). Some examples contain an illustrated overview that shows the main steps in the examples. Other examples are specific to a particular platform.

Step-by-step clone overview - all platforms

In the following exampl , you will use the SnapView clone CLI commands (explained in SnapView Clone CLI commands on page 990) in addition to the admsnap clone commands to set up (from the production server) and use a clone (from the secondary server).

1. On the system, bind a LUN for each SP to serve as a clone private LUN.

   The clone private LUNs (one for each SP) are shared by all clone groups on a system.

   The clone private LUNs store temporary system information used to speed up synchronization of the source LUN and its clone. These structures are called fracture logs. The clone private LUN can be any public LUN that is not part of any storage group. The minimum and standard size for each clone private LUN is 1 Gigabyte. There is no benefit in performance, or otherwise, to using clone private LUNs larger than 1 Gigabyte.

2. On the system, bind a LUN to serve as the clone. Each clone should be the same size as the source LUN. The source and clone LUNs can be on the same SP or different SPs.

3. If the source LUN does not exist (for example, because you are creating a new database), you can bind it at the same time as the clone. Then you can add the new source LUN to a storage group.

4. On the system, allocate the clone private LUNs. Use the CLI command option **`-allocatecpl`** for this (refer to clone | snapview -allocatecpl on page 1000).

5. On the system, create the clone group. Use the CLI command option **`-createclonegroup`** for this (refer to clone | snapview -changeclonegroup on page 1005).

6. If the LUN you choose as your clone is mounted on a secondary server, deactivate the LUN from the server it is mounted on by issuing the appropriate command for your operating system.

   - On a Windows server, use the following admsnap command: `admsnap clone_deactivate -o clone drive_letter`
   - On a UNIX server, unmount the file system on the LUN you want to use as a clone by issuing the **`umount`** command.

- On a Novell NetWare server, use the **dismount** command on the volume to dismount the file system.

7. On the system, add the LUN you bound as your clone in step 2 to the clone group. Use the CLI command **-addclone** for this (see page 51).

   By default, when you use the **-addclone** command, the software starts synchronizing the clone (copying source LUN data to the clone). If the source LUN has meaningful data on it, then synchronization is necessary. Depending on the size of the source LUN, a synchronization may take several hours.

   If you do not want the default synchronization to occur when you add the clone to the clone group, then you can tell the CLI that synchronization is not required. To do this use the **-issynchrequired** option in the **-addclone** command. An initial synchronization is not required if your source LUN does not contain any data. If you specify an initial synchronization with an empty source LUN, resources are used to synchronize the source LUN to the clone LUN.

8. After the clone is synchronized, do the following before fracturing it:

   a. Quiesce I/O to the source LUN.

   b. Flush all cached data to the source LUN by issuing the appropriate command for your operating system.

      - For a Windows server, use the **admsnap flush** command to flush all server buffers: `admsnap flush -0 E:`
      - For Solaris, HP-UX, AIX, and Linux servers, unmount the file system by issuing the **umount** command. If you are unable to unmount the file system, you can issue the **admsnap flush** command:`admsnap flush -o /dev/rdsk/c1t0d2s2`
      - For a Novell NetWare server, use the **dismount** command on the volume to dismount the system.

      Note: Neither the **flush** command nor the **sync** command is a substitute for unmounting the file system. Both commands only complement unmounting the file system.

      With some operating systems, additional steps may be required from the secondary server in order to flush all data and clear all buffers on the secondary server. For more information, see the product release notes.

   c. Wait for the clone to transition to the synchronized state.

9. Fracture the clone using the CLI fracture command. Use the CLI command function **-fractureclone** for this clone | snapview -fractureclone on page 1013.

10. Assign the clone to a storage group. You must assign the clone LUN to a storage group other than the storage group that holds the source LUN. Use the Navisphere CLI

command **storagegroup** as described in the *EMC Navisphere Command Line Interface (CLI) Reference*.

11. Activate the clone.

    - For Windows, use the **admsnap clone_activate** command to make the newly fractured clone available to the operating system. After a delay, the **admsnap clone_activate** command finishes rescanning the system and assigns drive letters to newly discovered clone devices.

      Note: If the secondary server is running Windows 2000, a reboot is recommended but not required.

    - For UNIX servers, for all platforms except Linux, **clone_activate** tells the operating system to scan for new LUNs. For Linux, you must either reboot the server or unload and load the HBA driver.
    - On a NetWare server, run the command **list devices** or use the command **scan** all LUNs on the console.

12. If you have a VMWare ESX Server, do the following:
    a. Rescan the bus at the ESX Server level.
    b. If a virtual machine is already running, power off the virtual machine and use the Service Console of the ESX Server to assign the clone to the virtual machine. If a virtual machine is not running, create a virtual machine on the ESX Server and assign the clone to the virtual machine.
    c. Power on the virtual machine and scan the bus at the virtual machine level. For virtual machines running Windows, you can use the **admsnap activate** command to rescan the bus.

13. Verify that the contents of the source LUN and clone LUN are synchronized.

14. Resume I/O to the source LUN.

15. Use the fractured clone as you wish—for backup, reverse synchronization, or other use.

16. To update the clone with any source LUN modifications made since you fractured it, perform the following steps:
    a. Flush and deactivate the clone.

       - For Windows, use the **admsnap flush** and **admsnap clone_deactivate** commands to flush all server buffers, to dismount, and to remove the drive letter assigned by **clone _activate**. For multi-partitioned clone devices, those having more than one drive letter mounted on it, all other drive letters associated with this physical clone device will also be flushed, dismounted, and removed. `admsnap flush -o E:admsnap clone_deactivate E:`

- For UNIX, unmount the file system by issuing the **umount** command. If you cannot unmount the file system, you can use the **sync** command to flush buffers. The **sync** command is not considered a substitute for unmounting the file system, but you can use it to reduce the number of incidents of having to fsck the file system on your backup server. Refer to your system's man pages for **sync** command usage.
- For NetWare, use the **dismount** command on the clone volume to dismount the file system.

b. Remove the clone from the storage group.

c. Synchronize the clone. Use the CLI command **-syncclone** for this (refer to clone | snapview -syncclone on page 1031).

d. Repeat steps 8-15.

17. When you have finished with this clone, you can remove the clone from its clone group. You can also do the following:
    - Destroy the clone group by using the CLI command **-destroyclonegroup** (refer to clone | snapview -destroyclonegroup on page 1012) .
    - Remove the clone LUN by using the CLI command **-removeclone** (refer to clone | snapview -removeclone on page 1025).
    - Deallocate the clone private LUNs by using the CLI command **-deallocatecpl** (refer to clone | snapview -deallocatecpl on page 1011).

Clone use illustration

The below figure shows how you might use a clone.

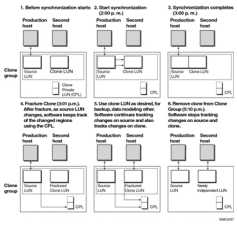


Figure 24. Using a clone

Windows - clone example

The following example shows all the naviseccli or navicli and admsnap commands needed to set up and use a clone on a Windows platform. It includes binding and unbinding the LUNs and RAID groups.

Note: To use this command with navicli, replace naviseccli with navicli.

If a virtual machine is not running, create a virtual machine on the ESX Server and assign the clone to the virtual machine.

1. Create the source and clone RAID groups and bind the LUNs.

```
naviseccli -h ss_spA createrg 10 1_0 1_1 1_2 1_3 1_4   naviseccli -h
ss_spA createrg 11 1_5 1_6 1_7 1_8 1_9   naviseccli -h ss_spA bind r5 20
-rg 10 -sp A  naviseccli -h ss_spA bind r5 21 -rg 11 -sp A
```

Note: To use these commands with navicli, replace naviseccli with navicli.

2. Create the clone private LUNs, each 1 Gigabyte long.

```
naviseccli -h ss_spA createrg 100 2_1 2_2 2_3 2_4 2_5naviseccli -h ss_spA
bind r5 100 -rg 10 -sp A -sq mb -cp 200 naviseccli -h ss_spa bind r5 101
-rg 10 -sp A -sq mb -cp 200
```

3. Wait for all the LUNs to complete binding. Then set up the storage groups.

```
aviseccli -h ss_spa storagegroup -create -gname Production naviseccli -h
ss_spa storagegroup -create -gname Backup naviseccli -h ss_spa
storagegroup -connecthost -o -server ServerABC -gname Production
naviseccli -h ss_spa storagegroup -connecthost -o -server ServerXYZ -gname
Backup naviseccli -h ss_spa storagegroup -addhlu -gname Production -hlu
20 -alu 20 naviseccli -h ss_spa storagegroup -addhlu -gname Backup -hlu
21 -alu 21
```

4. On both servers, rescan or reboot to let the operating systems see the new LUNs.

5. Allocate the clone private LUNs.

```
naviseccli -User GlobalAdmin -Password mypasssw -Scope 0 -Address ss_spa
clone -allocatecpl -spA 100 -spB 101 -o
```

6. Create the clone group and add the clone.

```
naviseccli -User GlobalAdmin -Password mypassw -Scope 0 -Address ss_spa
clone -createclonegroup -name lun20_clone -luns 20 -description
Creatinglun20_clone -onaviseccli -User GlobalAdmin -Password password
-Scope 0 -Address ss_spa clone -addclone -name lun20_clone -luns 20
```

7. Run Disk Management on the production server and create an NTFS file system on the source LUN. Copy files to the drive letter assigned to the source LUN on the production server. This example uses `g:` as the drive letter for the source LUN.

8. On the production server, run admsnap to write the buffers.

   ```
   admsnap flush -o g:
   ```

   The clone transitions to the synchronized state.

9. Fracture the clone.

   ```
   naviseccli -User GlobalAdmin -Password password -Scope 0 -Address ss_spa
   clone -fractureclone -name lun20_clone -cloneid 0100000000000000 -o
   ```

10. On the secondary server, run admsnap to activate the clone.

    ```
    admsnap clone_activate
    ```

    The admsnap software returns a drive letter for the drive assigned to the clone that was just fractured. This example uses h: as the drive letter for the clone LUN.

11. Verify that the files that were copied to the source LUN also appear on the clone LUN.

12. If you have a VMware ESX Server, do the following:

    a. Rescan the bus at the ESX Server level.

    b. If a virtual machine is already running, power off the virtual machine and use the Service Console of the ESX Server to assign the clone to the virtual machine. If a virtual machine is not running, create a virtual machine on the ESX Server and assign the clone to the virtual machine.

    c. Power on the virtual machine and scan the bus at the virtual machine level. For virtual machines running Windows, you can use the **`admsnap activate`** command to rescan the bus.

13. On the secondary server, delete the existing files and copy different files to the clone (to `h:`).

14. On the secondary server, run admsnap to deactivate the clone.

    ```
    admsnap clone_deactivate -o h:
    ```

15. On the production server, run admsnap to deactivate the source.

    ```
    admsnap clone_deactivate -o g:
    ```

16. Reverse synchronize to copy the data written to the clone back to the source.

```
naviseccli -User GlobalAdmin -Password password -Scope 0 -Address ss_spa
clone -reversesyncclone -name lun20_clone -cloneid 0100000000000000 -o
```

17. Fracture the clone again to make the source independent.

```
naviseccli -User GlobalAdmin -Password password -Scope 0 -Address ss_spa
clone -fractureclone -name lun20_clone -cloneid 0100000000000000 -o
```

18. On the production server, verify that the clone (g:) contains the files that were written to the clone on the secondary server. It also should not contain the files that were deleted from the clone.

19. On the production server, use admsnap to deactivate the source.

```
admsnap clone_deactivate -o h:
```

Reverse synchronization - all platforms

The following example illustrates the admsnap and Navisphere CLI commands required to reverse-synchronize a fractured clone.

1. From the production server, stop I/O to the source LUN.

2. Using admsnap, do the following:

   - From the production server, deactivate the source LUN by issuing the appropriate command for your operating system.

     - On a Windows server, use the following admsnap command:

       ```
       admsnap clone_deactivate -o source-drive-letter
       ```

     - On a UNIX server, unmount the file system by issuing the **`umount`** command. If you cannot unmount the file system, use the **`sync`** command to flush buffers. Although the sync command is not a substitute for unmounting the file system, you can use it to reduce the number of times you need to issue the **`fsck`** command on the secondary server's file system. Refer to your system's man pages for **`sync`** command usage.

     - On a NetWare server, use the **`dismount`** command on the volume to dismount the file system.

   - If the clone is mounted on a secondary server, flush all cached data to the clone LUN by issuing the appropriate command for your operating system.

- For a Windows server, use the **admsnap flush** command.
- For Solaris, HP-UX, AIX, and Linux servers, unmount the file system by issuing the **umount** command. If you are unable to unmount the file system, issue the **admsnap flush** command. The **flush** command flushes all data and clears all buffers.
- On a Novell NetWare server, use the **dismount** command on the volume to dismount the file system.

Note: Neither the **flush** command nor the **sync** command is a substitute for unmounting the file system. Both commands only complement unmounting the file system.

With some operating systems, additional steps may be required from the secondary server in order to flush all data and clear all buffers on the secondary server. For more information, see the product release notes.

3. Using Navisphere CLI, issue the following command from the SP that owns the source LUN:

```
clone -reversesyncclone -name name|-clonegroupUid  uid   -cloneid  id
[-UseProtectedRestore 0|1]
```

Note: Before you can use the protected restore feature, you must globally enable it by issuing the **clone | snapview -changeclonefeature [-AllowProtectedRestore 1]** command.

Important: When the reverse synchronization begins, the software automatically fractures all clones in the clone group.

Depending on whether or not you enabled the **Protected Restore** feature, the following occurs to the clone that initiated the reverse synchronization:

- With the **Protected Restore** feature – the software fractures the clone after the reverse synchronization completes.
- Without the **Protected Restore** feature – the software leaves the clone unfractured.

Step-by-step snapshots overview - all platforms

In the following procedures, you will use the SnapView snapshot CLI commands in addition to the admsnap snapshot commands to set up (from the production server) and use snapshots (from the secondary server).

1. Choose the LUNs for which you want a snapshot. The size of these LUNs will help you determine an approximate reserved LUN pool size. The LUN(s) in the reserved LUN pool stores the original data when that data is first modified on the source LUN(s).

   Note: To manually estimate a suitable LUN pool size, refer to **Managing Systems** > **Configuring and Monitoring the Reserved LUN Pool** in the Table of Contents for the Unisphere online help and select the **Estimating the Reserved LUN Pool Size** topic.

2. Configure the reserved LUN pool.

   Note: You must configure the reserved LUN pool before you start a SnapView session. Use Unisphere to configure the reserved LUN pool (refer to **Managing Systems** > the Unisphere online help in the Unisphere online help) . Stop I/O and make sure all data cached on the production server is flushed to the source LUN(s) before issuing the **`admsnap start`** command.

   - For a Windows server, you can use the **`admsnap flush`** command to flush the data.
   - For Solaris, HP-UX, AIX, and Linux servers, unmount the file system by issuing the **`umount`** command. If you are unable to unmount the file system, you can issue the **`admsnap flush`** command.
   - For a Novell NetWare server, use the **`dismount`** command on the volume to dismount the file system.

   Note: Neither the **`flush`** command nor the **`sync`** command is a substitute for unmounting the file system. Both commands only complement unmounting the file system.

3. Using Navisphere CLI, create a snapshot of the source LUN(s) for the system that holds the source LUN(s), as follows. You must create a snapshot for each session you want to access simultaneously.

   Use the **`naviseccli`** or **`navicli snapview`** command with **`-createsnapshot`** to create each snapshot.

   ```
   naviseccli -h hostname snapview -createsnapshot
   ```

4. On the production server, log in as `admin` or `root` and issue an **`admsnap start`** command for the desired data object (drive letter, device name, or file system) and session name. The **`admsnap start`** command starts the session. You must start a session for each snapshot of a specific LUN(s) you want to access simultaneously.

   You start a session from the production server based on the source LUN(s). You will mount the snapshot on a different server (the secondary server). You can also mount additional snapshots on other servers.

You can start up to eight sessions per source LUN. This limit includes any reserved sessions that are used for another application such as SAN Copy and MirrorView/Asynchronous. However, only one SnapView session can be active on a secondary server at a time. If you want to access more than one snapshot simultaneously on a secondary server (for example, 2:00 p.m. and 3:00 p.m. snapshots of the same LUN(s), to use for rolling backups), you can create multiple snapshots, activate each one on a different SnapView session and add the snapshots to different storage groups. Or you can activate and deactivate snapshots on a single server.

The SnapView driver will use this moment as the beginning of the session and will make a snapshot of this data available. Sample **`start`** commands follow:

IBM AIX Server (UNIX)

```
admsnap start -s  session1  -o  /dev/hdisk21
```
(for a device name)

```
admsnap start -s  session1  -o  /database
```
(for a file system)

HP-UX Server (UNIX)

```
admsnap start -s  session1  -o  /dev/rdsk/c0t0d0
```
(for a device name)

```
admsnap  start -s  session1  -o  /database
```
(for a file system)

Veritas Volume examples:

Example of a Veritas volume name: `scratch`

Example of a fully qualified pathname to a Veritas volume:

```
admsnap start -s session1 -o /dev/vx/dsk/scratchdg/scratch
```

Example of a fully qualified pathname to a raw Veritas device name:

```
admsnap start -s session1 -o /dev/vx/rdmp/c1t0d0
```

Linux Server (UNIX)

```
admsnap  start -s  session1  -o  /dev/sdc
```
(for a file system)

```
admsnap  start -s  session1  -o  /database
```
(for a file system)

Veritas Volume examples:

Example of a Veritas volume name: scratch

Example of a fully qualified pathname to a Veritas volume:

```
admsnap start -s session1 -o /dev/vx/dsk/scratchdg/scratch
```

Example of a fully qualified pathname to a raw Veritas device name:

```
admsnap start -s session1 -o /dev/vx/rdmp/sdc6
```

NetWare Server

```
load  sys:\emc\admsnap\admsnap  start  -s

session1 -o  V596-A2-D0:2
```
(for a device name)

(`V596` is the vendor number.)

Sun Solaris Server (UNIX)

```
admsnap start -s session1 -o  /dev/rdsk/c0t0d0s7
```
(for a device name)

```
admsnap  start -s  session1 -o  /database
```
(for a file system)

Veritas Volume examples:

Example of a Solaris Veritas volume name: `scratch`

Example of a fully qualified pathname to a Veritas volume:

```
admsnap start -s session1 -o /dev/vx/dsk/scratchdg/scratch
```

Example of a fully qualified pathname to a raw Veritas device name:

```
admsnap start -s session1 -o /dev/vx/rdmp/c1t0d0s2
```

Windows Server

```
admsnap  start  -s  session1 \.\\PhysicalDrive1
```
(for a physical drive name)

```
admsnap  start  -s  session1   -o  H:
```
(for a drive letter)

5. If you do not have a VMware ESX Server - Use the **storagegroup** command to assign each snapshot to a storage group on the secondary server. If you have a VMware ESX Server, - skip to Step 7 to activate the snapshot.

6. On the secondary server, use an **admsnap activate** command to make the new session available for use.

   A sample **admsnap activate** command is:

   ```
   admsnap activate -s  session1
   ```

   - On a Windows server, the **admsnap activate** command finishes rescanning the system and assigns drive letters to newly discovered snapshot devices. You can use this drive immediately.
   - On an AIX server, you need to import the snap volume (LUN) by issuing the **chdev** and **importvg** commands as follows:

     ```
     chdev -l hdiskn -a pv=yes
     ```
     (This command is needed only once for any LUN.)

     ```
     importvg -y volume-group-name hdisk n
     ```

     where *n* is the number of the hdisk that contains a LUN in the volume group and *volume-group-name* is the volume group name.

   - On a UNIX server, after a delay, the **admsnap activate** command returns the snapshot device name. You will need to run fsck on this device only if it contains a file system and you did not unmount the source LUN(s). Then, if the source LUN(s) contains a file system, mount the file system on the secondary server using the snapshot device name to make the file system available for use. If you failed to flush the file system buffers before starting the session, the snapshot may not be usable.

     Depending on your operating system platform, you may need to perform an additional step before you type **admsnap activate** to rescan the I/O bus. For more information, see the product release notes.

     For UNIX, run fsck on the device name returned by the **admsnap** command, but when you mount that device using the **mount** command, use a device name beginning with `/dev/dsk` instead of the device name **/dev/rdsk** as returned by the **admsnap** command.

   - On a NetWare server, issue a list devices or **Scan All LUNs** command from the server console. After a delay, the system returns the snapshot device name. You can then mount the volume associated with this device name to make a file system available for use. You may need to perform an additional step to rescan the I/O bus. For more information, see the product release notes.

7. If you have a VMWare ESX Server:

   a. Use the **storagegroup** command to add the snapshot to a storage group connected to the ESX Server that will access the snapshot.

   b. Rescan the bus at the ESX Server level.

c. If a virtual machine is already running, power off the virtual machine and use the Service Console of the ESX Server to assign the snapshot to the virtual machine.

   If a virtual machine is not running, create a virtual machine on the ESX Server and assign the snapshot to the virtual machine.

d. Power on the virtual machine and scan the bus at the virtual machine level. For virtual machines running Windows, you can use the **admsnap activate** command to rescan the bus.

8. On the secondary server, you can access data on the snapshot(s) for backup, data analysis, modeling, or other use.

9. On the secondary server, when you finish with the snapshot data, release each active snapshot from the operating system as follows:

   - On a Windows server, release each snapshot device you activated, using the **admsnap deactivate** command.
   - On a UNIX server, you need to unmount any file systems that were mounted from the snapshot device by issuing the **umount** command. Then release each snapshot device you activated, using the **admsnap deactivate** command.
   - On a NetWare server, use the **dismount** command on the volume to dismount the file system.
   - On an AIX server, you need to export the snap volume (LUN) by issuing the **varyoff** and **export** commands as follows:

     ```
     varyoffvg volume-group-name

     exportvg volume-group-name
     ```

   Then release each snapshot device you activated, using the **admsnap deactivate** command.

10. On the production server, stop the session using the **admsnap stop** command. This frees the reserved LUN and SP memory used by the session, making them available for use by other sessions.

    Sample **admsnap stop** commands are identical to the **start** commands shown in step 3. Substitute **stop** for **start**.

11. If you will not need the snapshot of the source LUN(s) again soon, use the CLI **snapview -rmsnapshot** command to remove it.

    If you remove the snapshot, then for a future snapshot you must execute all previous steps. If you do not remove the snapshot, then for a future snapshot you can skip steps 4 through 6.

SnapView session

Figure 25 on page 1116 shows how a SnapView session starts, runs, and

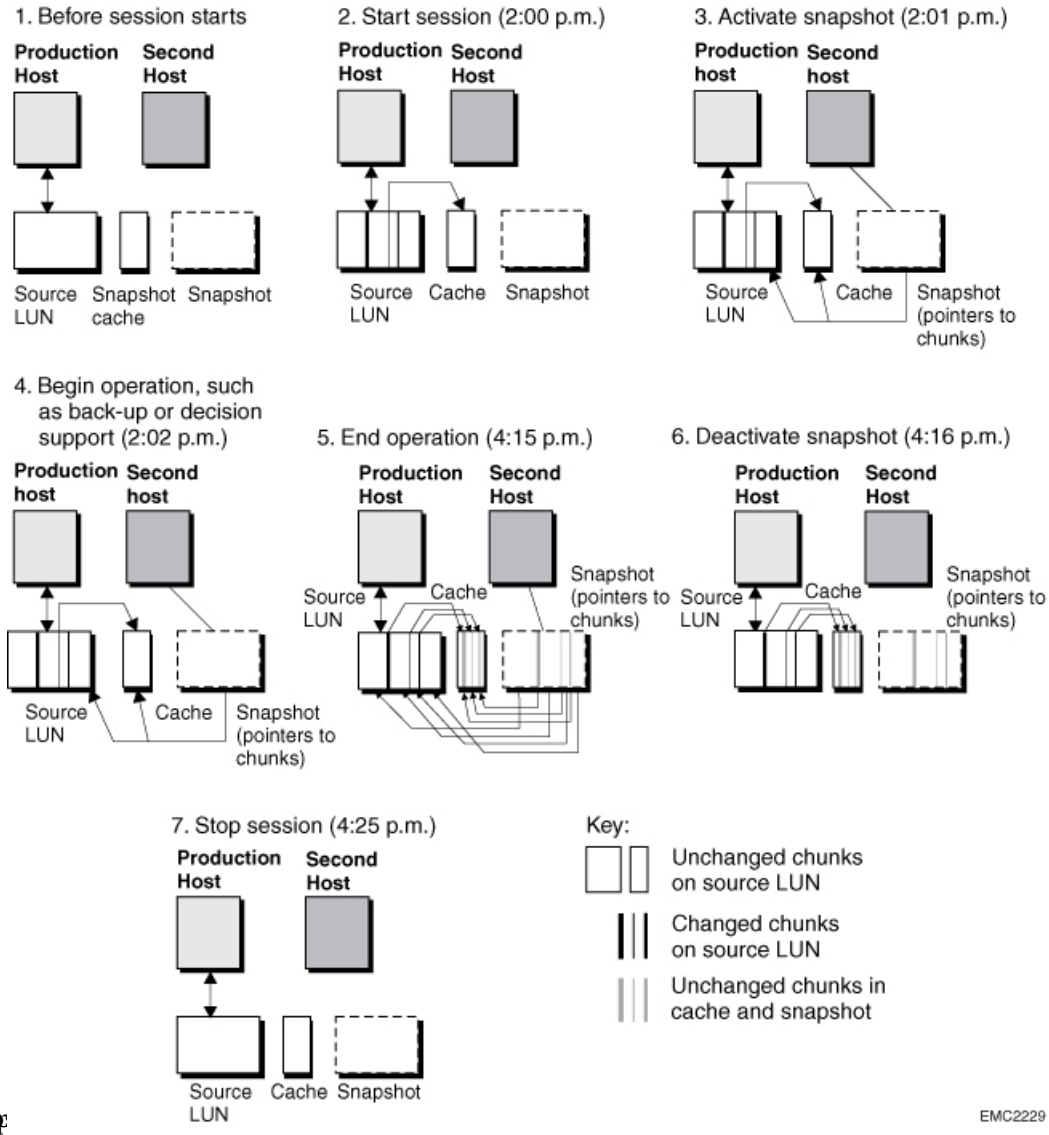


Figure 25. SnapView session states

HP-UX - admsnap snapshot script example

The following example shows how to use admsnap with scripts for copying and accessing data on an HP-UX secondary server.

1. From the production server, create the following script:

   Script 1

   a. Quiesce I/O on the source server.

   b. Unmount the file system by issuing the **umount** command. If you are unable to unmount the file system, issue the **admsnap flush** command. The **flush** command flushes all cached data.

   Note: The **flush** command is not a substitute for unmounting the file system; the command only complements the unmount operation.

   c. Start the session by issuing the following command:

   ```
   /usr/admsnap/admsnap start -s snapsession_name -o device_name or
    filesystem_name
   ```

   d. Invoke Script 2 on the secondary server using the **remsh** command.

   e. Stop the session by issuing the following command:

   ```
   /usr/admsnap/admsnap stop -s snapsession_name -o device_name or
    filesystem_name
   ```

2. From the secondary server, create the following script:

   Script 2

   a. Perform any necessary application tasks in preparation for the snap activation (for example, shut down database).

   b. Activate the snapshot by issuing the following command:

   ```
   /usr/admsnap/admsnap activate -s snapsession_name
   ```

   c. Create a new volume group directory, by using the following format:

   ```
   mkdir/dev/volumegroup_name

   mknod/dev/volumegroup_name/group c 64 0x X0000
   ```

   d. Issue the **vgimport** command, using the following format:

   ```
   vgimport volumegroup_name/dev/dsk/cNtNdN
   ```

   e. Activate the volume group for this LUN by entering the following command:

   ```
   vgchange -a y volumegroup_name
   ```

f. Run fsck on the volume group by entering the following:

```
fsck -F filesystem_type /dev/volumegroup_name/logicalvolume_name
```

This step is not necessary if the secondary server has a different HP-UX operating system revision than the production server.

g. Mount the file system using the following command:

```
mount/dev/volumegroup_name/logicalvolume_name/filesystem_name
```

h. Perform desired tasks with the mounted data (for example, copy the contents of the mounted file system to another location on the secondary server).

i. Unmount the file system mounted in step g using the following command:

```
umount /dev/volumegroup_name/logicalvolume_name
```

j. Deactivate and export the volume group for this LUN, by issuing the following commands:

```
vgchange -a n volumegroup_name
```

```
vgexport volumegroup_name
```

k. Unmount the file system by issuing the **umount** command. If you are unable to unmount the file system, issue the **admsnap flush** command. The **flush** command flushes all cached data. If this is not done, the next admsnap session may yield stale data.

l. Deactivate the snapshot by using the following command:

```
/usr/admsnap/admsnap deactivate -s snapsession_name
```

m. Perform any necessary application tasks in preparation for using the data captured in step 6 (for example, start up the database).

n. Exit this script, and return to Script 1.

UNIX - admsnap single session example

The following commands start, activate, and stop a SnapView session. This example shows UNIX device names.

1. On the production server, make sure all cached data is flushed to the source LUN, by unmounting the file system.

```
umount /dev/dsk/c12d0s4
```

If you are unable to unmount the file system on a Solaris, HP-UX, AIX, or Linux server, you can issue the **admsnap flush** command.

```
admsnap flush -o/dev/rdsk/c12d0s4
```

Note: Neither the **flush** command nor the **sync** command is a substitute for unmounting the file system. Both commands only complement unmounting the file system.

---

2. Start the session:

```
admsnap start -s  friday -o  /dev/rdsk/c1t2d0s4
     Attempting to start session friday on device /dev/rdsk/c1t2d0s4
     Attempting to start the session on the entire LUN.
     Started session friday.
```

The **start** command starts a session named **friday** with the source named `/dev/rdsk/c1t2d0s4`.

3. On the secondary server, activate the session:

```
admsnap activate -s friday
     Session friday activated on /dev/rdsk/c5t3d2s1.
```

On the secondary server, the **activate** command makes the snapshot image accessible.

4. On a UNIX secondary server, if the source LUN has a file system, mount the snapshot:

```
mount /dev/dsk/c5t3d2s1 /mnt
```

5. On the secondary server, the backup or other software accesses the snapshot as if it were a standard LUN.

6. When the desired operations are complete, from the secondary server, unmount the snapshot. With UNIX, you can use **admsnap deactivate** to do this.

```
admsnap deactivate -s friday -o /dev/dsk/c5t3d2s1
```

7. And from the production server, stop the session:

```
admsnap stop -s friday -o /dev/dsk/c1t2d0s4
```

Stopped session **friday** on object `/dev/rdsk/c1t2d0s4`.

The **stop** command terminates session **friday**, freeing the reserved LUN used by the session, and making the snapshot inaccessible.

Windows - admsnap multiple session example

This example shows three SnapView sessions, started and activated sequentially, using Windows device names.

The example shows how each snapshot maintains the data at the time the snapshot was started here, the data is a listing of files in a directory. The activity shown here is the only activity on this LUN during the sessions.

Procedural overview

1. Make sure the directory that holds admsnap is on your path.
2. Start sessions `snap1`, `snap2`, and `snap3` on the production server in sequence and then activate each session in turn on the secondary server. All sessions run on the same LUN.
3. When session `snap1` starts, four files exist on the LUN. Before starting `snap2`, create four more files in the same directory. Then, on the secondary server, deactivate `snap1`. The deactivate is needed because only one session can be active per server at one time.
4. On the production server start `snap2`, and on the secondary server activate `snap2` . After activating `snap2`, list the files, displaying the files created between session starts.
5. Create three more files on the source LUN and start session `snap3`. After deactivating `snap2` and activating `snap3`, verify that you see the files created between the start of sessions `snap2` and `snap3`. The filenames are self-explanatory.

Session snap1 detailed procedure and output

1. On the production server, list the files in the test directory.

```
F:\> cd test

F:\Test> dir

..

Directory of F:\Test

01/21/2002 09:23a <DIR> .

01/21/2002 09:23a <DIR> ..

01/21/2002 09:21a 0 FilesBeforeSession1-a.txt

01/21/2002 09:21a 0 FilesBeforeSession1-b.txt

01/21/2002 09:21a 0 FilesBeforeSession1-c.txt

01/21/2002 09:21a 0 FilesBeforeSession1-d.txt
```

```
4 File(s) 0 bytes

2 Dir(s) 102,225,920 bytes free
```

The profile file `TP_DOMAIN_XYZ.PFL` (with the correct name) is stored in the directory `/usr/sap/trans/bin`.

2. On the production server, flush the data on the source LUN, and then start the first session, **snap1**.

```
F:\Test> admsnap flush -o f:

F:\Test> admsnap start -s snap1 -o f:

Attempting to start session snap1 on device

\\.\PhysicalDrive1.

Attempting to start session on the entire LUN.

Started session snap1.

F:\Test>
```

3. On the secondary server, activate the first session, **snap1**.

```
C:\> prompt $t $p

14:57:10.79 C:\> admsnap activate -s snap1

Scanning for new devices.

Activated session snap1 on device F:.
```

4. On the secondary server, list the files to show the production files that existed at the session 1 start.

```
14:57:13.09 C:\ dir f:\test

...

Directory of F:\Test

01/21/02 09:23a <DIR> .

01/21/02 09:23a <DIR> ..

01/21/02 09:21a 0 FilesBeforeSession1-a.txt

01/21/02 09:21a 0 FilesBeforeSession1-b.txt

01/21/02 09:21a 0 FilesBeforeSession1-c.txt

01/21/02 09:21a 0 FilesBeforeSession1-d.txt

6 File(s) 0 bytes

102,225,920 bytes free
```

Session snap2 detailed procedure and output

1. On the production server, list the files in the test directory. The listing shows files created after session 1 started. Notice that we created four additional files.

```
F:\Test> dir
...
Directory of F:\Test
01/22/2002 03:03p <DIR> .
01/22/2002 03:03p <DIR> ..
01/21/2002 09:21a 0 FilesAfterS1BeforeS2-a.txt
01/21/2002 09:21a 0 FilesAfterS1BeforeS2-b.txt
01/21/2002 09:21a 0 FilesAfterS1BeforeS2-c.txt
01/21/2002 09:21a 0 FilesAfterS1BeforeS2-d.txt
01/21/2002 09:21a 0 FilesBeforeSession1-a.txt
01/21/2002 09:21a 0 FilesBeforeSession1-b.txt
01/21/2002 09:21a 0 FilesBeforeSession1-c.txt
01/21/2002 09:21a 0 FilesBeforeSession1-d.txt
8 File(s) 0 bytes
2 Dir(s) 102,225,920 bytes free
```

2. On the production server, start the second session, **snap2.**

```
F:\Test> admsnap flush -o f:
F:\Test> admsnap start -s snap2 -o f:
Attempting to start session snap2 on device \\.\PhysicalDrive1.
Attempting to start the session on the entire LUN.
Started session snap2.
F:\
```

3. On the secondary server, deactivate the session snap1, and activate the second session, **snap2.**

```
15:10:10.52 C:\> admsnap deactivate -s snap1
Deactivated session snap1 on device F:.
15:10:23.89 C:\> admsnap activate -s snap2
```

```
Activated session snap2 on device F:.
```

4. On the secondary server, list files to show source LUN files that existed at session 2 start.

```
15:10:48.04 C:\> dir f:\test
...
Directory of F:\Test
01/22/02 03:03p <DIR> .
01/22/02 03:03p <DIR> ..
01/21/02 09:21a 0 FilesAfterS1BeforeS2-a.txt
01/21/02 09:21a 0 FilesAfterS1BeforeS2-b.txt
01/21/02 09:21a 0 FilesAfterS1BeforeS2-c.txt
01/21/02 09:21a 0 FilesAfterS1BeforeS2-d.txt
01/21/02 09:21a 0 FilesBeforeSession1-a.txt
01/21/02 09:21a 0 FilesBeforeSession1-b.txt
01/21/02 09:21a 0 FilesBeforeSession1-c.txt
01/21/02 09:21a 0 FilesBeforeSession1-d.txt
10 File(s) 0 bytes
102,225,920 bytes free
```

Session snap3 detailed procedure and output

1. On the production server, list the files in the test directory. The listing shows the files created between the start of sessions 2 and 3.

```
F:\Test> dir
...
Directory of F:\Test
01/22/2002 03:25p <DIR> .
01/22/2002 03:25p <DIR> ..
01/21/2002 09:21a 0 FilesAfterS1BeforeS2-a.txt
01/21/2002 09:21a 0 FilesAfterS1BeforeS2-b.txt
01/21/2002 09:21a 0 FilesAfterS1BeforeS2-c.txt
01/21/2002 09:21a 0 FilesAfterS1BeforeS2-d.txt
01/21/2002 09:21a 0 FilesAfterS2BeforeS3-a.txt
```

```
01/21/2002 09:21a 0 FilesAfterS2BeforeS3-b.txt
01/21/2002 09:21a 0 FilesAfterS2BeforeS3-c.txt
01/21/2002 09:21a 0 FilesBeforeSession1-a.txt
01/21/2002 09:21a 0 FilesBeforeSession1-b.txt
01/21/2002 09:21a 0 FilesBeforeSession1-c.txt
01/21/2002 09:21a 0 FilesBeforeSession1-d.txt
11 File(s) 0 bytes
2 Dir(s) 102,225,920 bytes free
```

2. On the production server, flush the buffers and start the third session, **snap3**.

```
F:\Test> admsnap flush -o f:
F:\Test> admsnap start -s snap3 - o f:
Attempting to start session snap3 on device PhysicalDrive1.
Attempting to start the session on the entire LUN.
Started session snap3.
F:\Test>
```

3. On the secondary server, flush the buffers, deactivate session snap2, and activate the third session, **snap3**.

```
15:28:06.96 C:\> admsnap flush -o f:
Flushed f:.
15:28:13.32 C:\> admsnap deactivate -s snap2
Deactivated session snap2 on device F:.
15:28:20.26 C:\> admsnap activate -s snap3
Scanning for new devices.
Activated session snap3 on device F:.
```

4. On the secondary server, list the files to show the production server files that existed at session 3 start.

```
15:28:39.96 C:\> dir f:\test
...
Directory of F:\Test
01/22/02 03:25p <DIR> .
```

```
01/22/02 03:25p <DIR> ..
01/21/02 09:21a 0 FilesAfterS1BeforeS2-a.txt
01/21/02 09:21a 0 FilesAfterS1BeforeS2-b.txt
01/21/02 09:21a 0 FilesafterS1BeforeS2-c.txt
01/21/02 09:21a 0 FilesAfterS1BeforeS2-d.txt
01/21/02 09:21a 0 FilesAfterS2BeforeS3-a.txt
01/21/02 09:21a 0 FilesAfterS2BeforeS3-b.txt
01/21/02 09:21a 0 FilesAfterS2BeforeS3-c.txt
01/21/02 09:21a 0 FilesBeforeSession1-a.txt
01/21/02 09:21a 0 FilesBeforeSession1-b.txt
01/21/02 09:21a 0 FilesBeforeSession1-c.txt
01/21/02 09:21a 0 FilesBeforeSession1-d.txt
13 File(s) 0 bytes
102,225,920 bytes free
15:28:42.92 C:\Test>
```

5. On the secondary server, deactivate the last session.

```
15:28:45.04 C:\> admsnap deactivate -s snap3
```

6. On the production server, stop all sessions.

```
F:\Test>  admsnap stop -s snap1 -o f:

F:\Test> admsnap stop -s snap2 -o f:

F:\Test> admsnap stop -s snap3 -o f:
```

Using SnapView with AX4-5 series or AX series

This section describes the SnapView terminology differences between Navisphere Express and Navisphere Manager and the SnapView CLI commands that are supported on AX4-5 series or AX series systems.

Terminology differences between Navisphere Express and Navisphere Manager

As with Navisphere Express on AX series systems, Navisphere Manager on AX series systems allows users to manage SnapView. Since Manager's user interface must include functionality for all system types it supports, some SnapView commands and features are limited or unavailable for AX series systems. For more information, refer to SnapView limits on page 985

The following table lists and defines the SnapView terminology differences between Navisphere Express and Navisphere Manager. For terminology differences that are not specific to SnapView, refer to the EMC Unisphere online help.

Navisphere Express term	Navisphere Manager term	Navisphere Manager definition
snapshot	SnapView session and snapshot	A SnapView session is a point-in-time copy of a source LUN. The session keeps track of how the source LUN looks at a particular point in time. A snapshot is a virtual LUN and when activated, it allows a secondary server to view a SnapView session. You can create a snapshot before or after you start a SnapView session; however, the snapshot has no use until a secondary server activates it to a session.

Navisphere Express term	Navisphere Manager term	Navisphere Manager definition
disk resources	reserved LUN pool	The reserved LUN pool works with replication software, such as SnapView, SAN Copy, and MirrorView, to store data or information required to complete a replication task. For example, with SnapView, after you start a SnapView session and as the production server writes to the source LUN, the software stores a copy of the original data in chunks in the reserved LUN pool. When a secondary server activates the snapshot to the SnapView session, the snapshot views the original source LUN data chunks that have been modified since you started the session from the reserved LUN pool and unmodified data chunks from the source LUN.

SnapView CLI commands supported for AX4-5 series or AX series systems

Depending on your AX4-5 series or AX series system fand management software, some SnapView commands and switches are limited or unavailable. The below table lists the commands that are supported for AX4-5 series and AX series systems.

Note: Navisphere CLI is not supported on AX series (AX150 and AX100) systems with Navisphere Express.

Table 33. SnapView CLI commands supported for AX4-5 and AX series systems

Command	Supported on			
	AX4-5 series with Navisphere Express	AX4-5 series with Navisphere Manager		AX150 and AX100 series with Navisphere Manager enabled
		Without the SnapView enabler installed	With the SnapView enabler installed	
Snapshots				
-activatesnapshot	Yes	Yes	Yes	Yes
-chgrollback	No	No	Yes	No
-chgsnapshot	No	Yes	Yes	Yes
-createsnapshot	No	Yes	Yes	Yes

Table 33. SnapView CLI commands supported for AX4-5 and AX series systems *(continued)*

Command	Supported on			
	AX4-5 series with Navisphere Express	AX4-5 series with Navisphere Manager		AX150 and AX100 series with Navisphere Manager enabled
		Without the SnapView enabler installed	With the SnapView enabler installed	
-deactivatesnapshot	Yes	Yes	Yes	Yes
-destroysnapshot	Yes	No	No	No
-listrollback	No	No	Yes	No
-listsnapshots	Yes	Yes	Yes	Yes
-listsessions	Yes[a]	Yes[a]	Yes[a]	Yes[a]
-listsnapableluns	Yes	Yes	Yes	Yes
-lunpool	Yes	Yes	Yes	Yes
-preparesnapshot	Yes	No	No	No
-rmsnapshot	No	Yes	Yes	Yes
-startrollback	No	No	Yes	No
-startsession	Yes[a]	Yes[a]	Yes	Yes[a]
-stopsession	Yes	Yes	Yes	Yes
Clones				
-addclone	No	No	Yes	No
-allocatecpl	No	No	Yes	No
-changeclone	No	No	Yes	No
-changeclonegroup	No	No	Yes	No
-changeclonefeature	No	No	Yes	No
-consistentfractureclones	No	No	Yes	No
-createclonegroup	No	No	Yes	No
-deallocatecpl	No	No	Yes	No

[a] Some switches are not supported with this command.

Table 33. SnapView CLI commands supported for AX4-5 and AX series systems *(continued)*

Command	Supported on			
	AX4-5 series with Navisphere Express	AX4-5 series with Navisphere Manager		AX150 and AX100 series with Navisphere Manager enabled
		Without the SnapView enabler installed	With the SnapView enabler installed	
`-destroyclonegroup`	No	No	Yes	No
`-fractureclone`	No	No	Yes	No
`-listclone`	No	No	Yes	No
`-listclonefeature`	No	No	Yes	No
`-listclonegroup`	No	No	Yes	No
`-removeclone`	No	No	Yes	No
`-reversesyncclone`	No	No	Yes	No
`-syncclone`	No	No	Yes	No

Correcting bad blocks

This section describes what bad blocks are, how SnapView handles them, and what you can do to correct them.

Bad blocks overview

A bad block is an unreadable block on the LUN. The unreadable block is due to an incomplete write to the disk. Since there is an incomplete write to the disk, you cannot read the bad block on the LUN.

Although bad blocks are rare, they can occur anywhere on a LUN. If they occur in data or metadata, most operating systems will detect them and log errors, which causes applications to fail. If a bad block occurs in a file system's free space or in a database's free space, the server does not detect the bad block and it is essentially harmless.

Bad blocks and clones

If a bad block is encountered on the source LUN during a synchronization, SnapView generates a bad block at the same location on the clone LUN. If a bad block is encountered on the clone LUN during a reverse synchronization, SnapView generates a bad block at the same location on the source LUN. SnapView then proceeds with the synchronization or reverse synchronization operation. The LUNs are then a full copy of the source (if a synchronization was issued) or the clone (if a reverse synchronization was issued), which includes the original bad blocks.

SnapView generates a message in the event log to inform the user of the bad blocks on the LUN. After SnapView generates 20 messages, it stops logging bad blocks in the event log, but continues generating bad blocks on the clone LUN if one is encountered on the source LUN during a synchronization, or it continues generating bad blocks on the source LUN if one is encountered on the clone LUN during a reverse synchronization. If SnapView encounters more than 32,708 bad blocks, it aborts the synchronization or reverse synchronization operation.

If the bad blocks occur in a file system's free space or in a database's free space, SnapView detects them during a full synchronization (the initial synchronization) or reverse synchronization. Subsequent partial synchronizations encounter bad blocks only if they occur in a chunk that the server has written to.

Correcting bad blocks

Although bad blocks in a database's free space may be harmless, they can cause a synchronization or reverse synchronization operation to take longer than usual, in addition to generating excessive log messages.

You can correct a bad block by successfully writing to it. However, writing to it may be impossible if it is in free space. Instead, you can use a server-based utility to back up the

data from the LUN with bad blocks and then reformat or unbind/bind the LUN and restore the data from backup.

Bad blocks and rollback

If the software encounters a bad block on a reserved LUN during a rollback operation, SnapView generates a bad block on the source LUN. SnapView generates the bad block at the same location to which the block was supposed to be rolled back.

SnapView generates a message in the event log to inform you of the bad blocks on the source LUN. After 20 messages, SnapView stops logging bad blocks in the event log, but it continues generating bad blocks on the source LUN until the rollback operation is complete.

Correcting bad blocks

Although bad blocks in a database's free space may be harmless, they can cause a synchronization or reverse synchronization operation to take longer than usual, in addition to generating excessive log messages.

You can correct a bad block by successfully writing to it. However, writing to it may be impossible if it is in free space. Instead, you can use a server-based utility to back up the data from the LUN with bad blocks and then reformat or unbind/bind the LUN and restore the data from backup.

13

Using Online Help

Using online help

This chapter explains how to access the online help from the application's main window

The following online help is available from the Unisphere interface:

A set of organized, linked help topics

To access the online help table of contents, select ➤ **Help** ➤ **Help Topics** on the menu bar in the application's main window, or click the help icon in the toolbar.

Context-sensitive help topics

To display context-sensitive help, click the **Help** button displayed in each dialog box.

Appendix A

CLI Error Codes

This appendix lists the error codes that the Secure CLI returns. It also includes SnapView and MirrorView error codes, although these applications are explained in other manuals.

Major topics include:

Secure CLI error codes

General feature command errors

Error value (decimal)	Error value (hexadecimal)	Description
0	0x0000	CLI success.
1	0x0001	Invalid arguments.
19712	0x4D00	Management Server is not available.
19713	0x4D01	Error encountered during command execution.
19714	0x4D02	Invalid command entered.
19715	0x4D03	Command is running. Client should poll for status.
19717	0x4D05	Invalid speed supplied by user.
19718	0x4D06	Speed not supported on this port.
19728	0x4D10	CIM API Instance is NULL.
19920	0x4DD0	Invalid command.

Domain error codes

Error value (decimal)	Error value (hexadecimal)	Description
21408	0x53A0	Directory invalid command.
21409	0x53A1	Directory feature not available.
21410	0x53A2	Directory execute errors.

SAN Copy CLI error codes

Error value	Description
236	This version of FLARE software does not support Open SAN Copy.
237	Minimum input requirement for **`sancopy -create`** command.
238	Both the name and uid for a copy descriptor are supplied.
239	The name or uid of a copy descriptor is required.

Error value	Description
240	Specified destination LUN does not exist.
241	Both the destination LUN wwn and number are supplied.
242	The specified copy descriptor name is not unique to this SP.
243	Specified copy descriptor does not exist.
244	Cannot list and set environment at the same time.
245	Throttle switch must be specified.
246	Valid throttles are 1 to 10.
247	Valid max session numbers are 1 to 16.
248	Valid checkpoint intervals are 5 to 90 and divisible by 5, or disable to set checkpoint disabled.
249	Both the source wwn and number are specified.
250	The destination LUN size is less than the source LUN size.
251	The peer SP is alive. This command works only if the peer SP is down.
252	Either source or all destinations must be on the host SP.
253	Multiple descriptors have the same name.
254	Input the same LUN ID as the destination LUN more than one time.
255	The specified destination LUN already exists in this descriptor as a destination.
256	Copy length should be greater than zero.
257	The selected source LUN cannot be part of a SAN Copy session as it is either a private LUN or is in a transition state.
258	One of the selected destination LUNs cannot be part of the SAN Copy session as it is either a private LUN or is in a transition state.
259	Capacity of at least one of the destination LUNs is smaller than the source LUN.
260	Cannot have a SAN Copy session with source LUN on peer SP.
261	Cannot have a SAN Copy session with destination LUN on peer SP.
299	Invalid LUN number of snapshot name for the switch **-srclun**.

Error value	Description
300	Invalid SP name or SP IP address for the switch.
301	Cannot duplicate an incremental copy descriptor.
302	This command can be used only for an incremental SAN Copy session.
303	Cannot mark a session if it is already marked.
304	Cannot unmark a session if it is already unmarked.
305	Cannot specify **-nomark** switch if the session is marked.
306	Cannot specify **-copywholelun** switch if the session is marked.
307	Source LUN for the incremental descriptor should be on the SP you are targeting.
308	Snapshot LUN cannot be a source of an incremental copy descriptor.
309	**-changesonly** switch can be specified only for an incremental copy descriptor.
310	**-copywholelun** switch can be specified only for an incremental copy descriptor.
311	**-nomark** switch can be specified only for an incremental copy descriptor.
312	Invalid value specified for **-chgtype** switch.
313	Both **-changesonly** and **-copywholelun** switches cannot be specified.
314	Invalid value specified for **-nomark** switch.
315	This version of FLARE (Core) software does not support incremental SAN Copy.
316	Invalid link bandwidth value.
317	Invalid link bandwidth problem. Valid values are between 0.016 and 2048.
318	Invalid latency value.
319	Invalid granularity value. Valid values are 2,4,8,16,32, and 64.

Error value	Description
320	To create an incremental copy descriptor, you must *atleast* input the following parameters: ◆ switch **-name** and a given name for the new copy descriptor ◆ switch **-srcwwn** and its contents *or* switch **-srclun** and its contents ◆ switch **-destwwn** and its contents *or* switch **-destlunnumber** and its contents ◆ switch **-incremental** ◆ switch **-linkbw** and its value
321	To modify the descriptor to incremental type, you must provide the switch **-linkbw** and its value.
322	Cannot change the name of an incremental session.
323	Cannot specify latency for a full descriptor.
324	Cannot specify granularity for a full copy descriptor.
325	Cannot specify link bandwidth for a full copy descriptor.
339	Cannot change the source LUN of an incremental session.
340	The new descriptor type specified for the descriptor is same as the current descriptor type.
341	There are no copy descriptors on this SP.
342	Error occurred in removing following descriptors.
343	Value of latency cannot be greater than 4294967.
354	Invalid autorestart value—use On or Off.
363	Specified SAN Copy destination does not exist.
367	Source LUN must be on the SAN Copy/E storage system.
368	Invalid port WWN or LUN number.
369	Use only one parameter to change the source LUN: -chgsrcbywwn, -chgsrcbylun, or -chgsrcbyportwwn.
407	Supply either the name or the descriptor ID, not both.

Error value	Description
410	The specified destination LUN does not exist.
411	The new connection type is the same as the current connection type.
439	The source LUN is thin. This version of FLARE (Core) software does not support thin LUNs in a SAN Copy session.
440	One of the destination LUNs is thin. This version of FLARE (Core) software does not support thin LUNs in a SAN Copy session.
441	Cannot communicate with the SP. The SP may be unmanageable.

SnapView clone error codes

Error value (decimal)	Error value (hexadecimal)	Description
19264	0x4B40	Trans object creation failed.
19265	0x4B41	Trans object loss exception.
19266	0x4B42	Transaction exception.
19267	0x4B43	Unable to get specified instance
19268	0x4B44	No Lun numbers available.
19269	0x4B45	Generic exception.
19270	0x4B46	Cloneview name already used.
19271	0x4B47	Protected restore not enabled.
19272	0x4B48	Can not disable fast restore on cloneviews.
19273	0x4B49	Source or clone LUs exceeded max limit.
19274	0x4B4A	Can not change LU to private.
19275	0x4B4B	Can not add clone driver to LU ext attributes.
19276	0x4B4C	Can not remove clone driver from LU ext attributes.
19277	0x4B4D	LU not available.
19279	0x4B4F	CPL metaLUN not supported.
19264	0x4B40	SP not primary or controlling.
19265	0x4B41	Source LU is rolling back.
19276	0x4D40	Invalid snap clone command.
19777	0x4D41	over ride needed.
19778	0x4D42	Unexpected clone error occurred.

Error value (decimal)	Error value (hexadecimal)	Description
19779	0x4D43	Clone feature object is not available.
19780	0x4D44	Clone enabling software is not installed.
19781	0x4D45	Specified CloneGroup is not available.
19782	0x4D46	Specified Clone is not available.
19783	0x4D47	No available LUs for cloning on the system.
19784	0x4D48	Specified LU is not available for cloning.
19785	0x4D49	The Clone Private LUNs have not been allocated.
19792	0x4D50	The protected restore is not supported.
19793	0x4D51	The optional fast recovery is not supported.
19794	0x4D52	Can not add clone, the Max number of clones are already present on CloneGroup.
19795	0x4D53	Can not add clone, since a clone in the clone group is syncing or reverse syncing.
19796	0x4D54	Unable to sync or reverse sync clone before it be fractured.
19797	0x4D55	Unable to reverse sync clone because it is Out-Of-Sync.
19798	0x4D56	Unable to reverse sync clone because a clone in its CloneGroup is either Synchronizing or Reverse Synchronizing.
19799	0x4D57	Unable to sync clone because a clone in its Clone Group is either Reverse Synchronizing or Reverse Out-Of-Sync.
19800	0x4D58	Unable to deallocate CPL while there is still clone
19801	0x4D59	Can not perform create, addclone or allocateCPL on a LU while it is migrating.
19808	0x4D60	MetaLUN(s) cannot be used as clone private LUN(s).
19809	0x4D61	The luns being specified do not match the source luns. They have to be same capacity as the source luns.
19810	0x4D62	Can not perform setfeature on a LU while it is private.
20032	0x4E40	NAVIALU MR name already exists.
20033	0x4E41	NAVIALU MR LU is dirty.
20034	0x4E42	NAVIALU generic exception.
20035	0x4E43	NAVIALU transaction exception.
20036	0x4E44	NAVIALU MR Lu is private.
20037	0x4E45	NAVIALU MR consumed by aggregate.
20038	0x4E46	NAVIALU MR other drivers found.
20039	0x4E47	NAVIALU MR LU in expanding state.

Error value (decimal)	Error value (hexadecimal)	Description
20040	0x4E48	NAVIALU MR LU is shutdown state.
20041	0x4E49	NAVIALU MR ALU is max.
20042	0x4B4A	NAVIALU MR ALU is comp max.
20043	0x4E4B	NAVIALU MR comp in ALU max.
1898348624	0x71268050	An existing Clone in the CloneView is reverse-out-of-sync or reverse-syncing. A new Clone cannot be added.
1898348625	0x71268051	An existing CloneView has the same name as the specified CloneView.
1898348965	0x712681A5	An error occured allocating the Frozen Clones COD resources.
1898349113	0x71268239	Clone is already administratively fractured.
1898349116	0x7126823C	Can't start synchronization or reverse-sync operation from the current Clone image condition.
1898349123	0x71268243	Attempt to destroy a CloneView which still has at least one Clone.
1898349127	0x71268247	Attempt to remove a Clone while it is being synchronized or reverse-synced.
1898349135	0x7126824F	A Clone in the CloneView is currently in the reverse-out-of sync state.
1898349137	0x71268251	An existing Clone in the CloneView is reverse-syncing.

Error codes

Error value	Description
1	Invalid command line parameters
2	Too few parameters.
3	Too many parameters.
5	Invalid LUN number.
30	LUN does not exist.
39	Cannot access device.
41	Command not supported.
66	Error returned from agent.
89	ToInvalid switch combination.
123	Snapshot does not exist.
125	Invalid SP name.
127	Package number invalid.
128	This version of FLARE Software does not support nondisruptive software installation (NDU).

Error value	Description
129	Cannot open this file.
130	File does not exist.
131	RAID type must be r1 (RAID1), r3 (RAID 3), r5 (RAID 5), or r1_0 (RAID1/0).
132	Multiple subcommands specified. Check syntax.
133	Disk for PSM must be on DPE bus 0.
134	Configuration does not exist.
135	Configuration already exists.
136	Size specified is too small.
137	Configuration does not exist. Run the navicli initializearray command to configure the system.
138	First option must be a subcommand.
139	Cannot create RAID group for PSM (Persistent Storage Manager).
140	Name or UID (unique ID) is required.
141	Invalid name specified.
142	Image UID is required.
143	Name and LUN are required.
144	Storage system UID (unique ID) and LUN UID are required.
145	Mirror not found.
146	Image not found.
147	Synchronized rate cannot be changed since input image is primary.
148	Cannot specify both **-uid** and **-filename**.
149	Invalid cache.
150	Invalid session.
151	Session does not exist.
152	Session is stopping.
153	Invalid snapshot.
154	Snapshot does not exist.
155	The -o option requires -filename.
156	Path to store files is required.
157	Cannot specify both -all and -filename.
158	Enter file index or `quit`.
159	Invalid input.
160	Index is out of range.

Error value	Description
161	File not found.
162	Space not available to retrieve file.
163	Specified feature not supported.
164	Feature must be specified.
165	Cannot specify both '-lun' and '-lunuid'.
166	Invalid storage processor name.
167	PSM (Persistent Storage Manager) is not broken.
168	PSM (Persistent Storage Manager) is broken. Cannot list or create PSM.
169	LUN cannot be unbound.
170	Operation not supported on this type of storage system.
171	Incompatible arguments. Invalid storage system serial number.
172	Directory not specified.
173	Invalid number of blocks.
174	Number of blocks not specified.
175	Reading of data not supported on this storage system.
176	Invalid snapshot World Wide Name (WWN).
177	Invalid storage system serial number.
178	Navicli '-f' option required to store data in file.
179	Invalid IP address format.
180	Storage group cannot be shared.
181	Invalid HLU number.
182	Invalid ALU number.
183	Invalid port ID.
184	Remote server cannot be managed.
185	Email response test failed.
186	Email page response test failed.
187	Modem page response test failed.
188	Snmp response test failed.
189	Phone home response test failed.
190	Mandatory switch for email/emailpage.
191	Mandatory switch for modem page.
192	Mandatory switch for snmp.

Error value	Description
193	Only one message or file can be specified.
194	Valid dial string contains only digits, parentheses, hyphen.
195	File does not exist or cannot be opened.
196	Specified user already exists.
197	The offset switch is not supported for this storage system.
198	Valid COM port number is 1, 2, 3, or 4.
199	Valid dial command is atd, atDp or atD.
200	Valid message delay contains only ",,," (one or more commas).
202	Target LUN number is missing.
203	Session name is missing.
204	SnapView multiple session feature is not supported.
205	Cannot specify both snapshot name and snapshot ID.
206	Cannot specify both -mode and -simulation.
207	This command is not supported on remote server.
208	Switch -pathname must be specified.
209	Get local server attributes failed.
210	This version of FLARE Software does not support Hi5 RAID type.
211	Only one of the switches -snapshotid, -snapshotname, or -lun can be specified.
212	Specified session and snapshot must be based on the same source LUN.
215	The HLU (server LUN) number you specified cannot be found.
216	This command must be issued from the SP to which the LUN will trespass.
217	Invalid bus or enclosure number.
218	Invalid WWN Seed.
219	Invalid EMC Part Number.
220	This RAID group has maximum number of LUNs already.
223	Allocate log needs to specify a LUN with a valid owner.
224	This request has been issued through the SP that is not the current owner of the targeted LUN.
225	Simulated/non-simulated sessions are mixed on the same targeted LUN.
234	The LUN is in a storage group.
262	This version of FLARE software does not support rollback.
263	The switch -rate must be specified.

Error value	Description
264	Invalid rollback rate. Valid values are high, medium and low.
265	Cannot change the rollback rate. The specified session is not rolling back.
266	Cannot start a rollback operation. The specified session is not persistent.
267	Cannot start a rollback operation. The specified session is rolling back
268	Cannot start a rollback operation. At least one source LUN is involved in another rollback operation.
269	Cannot create a recovery session. At least one source LUN has maximum sessions already.
270	Invalid SnapView session name.
271	Simulation mode is not supported in this revision.
272	Snapshot cache chunk size cannot be changed in this revision.
273	Cannot stop a session when it is rolling back.
274	Cannot activate a snapshot on a session when the session is rolling back.
275	Cannot deactivate a snapshot when it is activated on a session that is rolling back.
276	Multiple mirrors with the same name have been found. Please use UID for a specific mirror.
294	This request must be issued from the SP that owns the session.
295	This request must be issued from the SP that owns the session that the snapshot is activated on.
296	Snapshot is already inactive.
297	Snapshot name with leading or trailing white space is invalid.
298	Cannot create a snapshot on private LUNs (hot spare, snap cache, PSM, and so on).
337	Remote mirror write intent log size is too small.
352	Consistent mode is not supported in this revision.
414	Mirror cannot resolve path.
433	LUN is in use.
0x6201	Poll failed
0x6202	Cannot create a session with a name longer than 255 characters.
0x6203	Cannot start a session on a LUN that has another session Rolling Back.
0x6205	The Snapshot name is too long
0x6207	Could not create the Snapshot because the SnapCopy driver could not be added to the Source LUN's driver stack.
0x6209	The attribute(s) cannot be set for private lun(s).
0x620A	Could not add SnapView driver to the LUN stack.
0x620B	Illegal default owner specified.

Error value	Description
0x620C	This SnapCopy session is not currently Rolling Back.
0x620D	A LUN for this SnapCopy session is currently being Rolled Back.
0x620E	SnapCopy RollBack is not supported.
0x620F	A Mirror or Clone is preventing a RollBack of this session. You must administratively fracture a Mirror or Clone when it is consistent or synchronized before starting a RollBack.
0x6210	Snapshot is not associated with a source LUN.
0x6211	Session not found in session list.
0x6212	Snap Copy Session is transitioning.
0x6213	Snap LUN region not found.
0x6214	Too many sessions for this snapshot.
0x6216	Could not remove the SAN Copy driver from this Snapshot.
0x6217	The LU is in a storage group.
0x6218	Snapshot is already inactive.
0x6219	No LUs to add to Reserved LUN pool (OR) Trying to exceed the maximum number of LUNs supported (OR) LU already in Reserved LUN pool (OR) The LU is transitioning (OR) LU is in a storage group (OR) LU in use by array feature.
0x621A	LU cannot be removed because it is currently allocated. (OR) LU not in Reserved LUN pool (OR)
0x621F	There is an active SAN Copy session operating on a LUN in the SnapView session. Please wait for it to complete before attempting to RollBack this session.
0x6221	LU is not available.

NQM error codes

Error value (decimal)	Error value (hexadecimal)	Description
19856	0x4D90	NPO feature object is not available.
19857	0x4D91	NPO driver is not installed.
19858	0x4D92	Unknown exception on CIMAPI calls.
19859	0x4D93	Specified CIM class object does not exist or can not be found.
19860	0x4D94	NULL return from CIM calls. NPO Object does not exist or method is not supported.
19861	0x4D95	Max class number NPO supports is reached.
19862	0x4D96	Cloneview name already used.
19863	0x4D97	Invalid NPO command line switches.

Error value (decimal)	Error value (hexadecimal)	Description
19864	0x4D98	Invalid NPO command line switches value.
19865	0x4D99	LUNs have to be specified by WWNs or LUN numbers.
19866	0x4D9A	Too few parameters.
19867	0x4D9C	Too many parameters.
19868	0x4D9D	Creating archive.
19869	0x4D9E	Need stop NPO.

MirrorView error codes

Error value (decimal)	Error value (hexadecimal)	Description
19872	0x4DA0	Invalid Sync Mirror command.
19873	0x4DA1	Invalid Async Mirror command.
19874	0x4DA2	Sync Mirror feature object is not available.
19875	0x4DA3	Async feature object is not available.
19876	0x4DA4	Sync enabling software is not installed.
19877	0x4DA5	Async enabling software is not installed.
19878	0x4DA6	Unexpected Sync Mirror error occur.
19879	0x4DA7	Unexpected Async error occur.
19880	0x4DA8	No available LUs for mirroring on the system.
19881	0x4DA9	Specified LU is not available for cloning.
19882	0x4DAA	Specified mirror source is not available.
19883	0x4DAB	Mirrorview requires same lun size on mirrored images.
19884	0x4DAC	LUN is in a storage group.
19885	0x4DAD	multiple error occurs.
19886	0x4DAE	intentlog allocate error.
19887	0x4DAF	intentlog deallocate error.
19888	0x4DB0	disablepath error.
19889	0x4DB1	layered driver can't be added to LU stack.
19890	0x4DB2	Adding a layered driver to LU stack failed.
19891	0x4DB3	Removing a layered driver to LU stack failed.
19892	0x4DB4	Mirror can't be activated.

Error value (decimal)	Error value (hexadecimal)	Description
19893	0x4DB5	The mirror can't be deactivated (not active).
19894	0x4DB6	Error on fracture image.
19895	0x4DB7	Error on sync image.
19896	0x4DB8	Error on promote image.
19897	0x4DB9	Requested image wasn't found/didn't exist.
19898	0x4DBA	Error on remove image.
19899	0x4DBB	Error on specified LU is used by other feature and can not be chosen as mirror LU.
19900	0x4DBC	Can not perform create, add secondary image or allocate WIL on a LU while it is migrating.
19901	0x4DBD	Can not perform setfeature on a LU while it is private.
19902	0x4DBE	Image not valid.
19903	0x4DBF	Setfeature on thin LUN unsupported.

MirrorView/A error codes

Error value (decimal)	Error value (hexadecimal)	Description
20288	0x4F40	Generic Exception.
20289	0x4F41	Mirror length name exceeds max.
20290	0x4F42	Mirror name already used.
20291	0x4F43	Mirror invalid number of LUs.
20292	0x4F44	Mirror group name length exceeds maximum.
20293	0x4F45	Mirror group name already used.
20294	0x4F46	Can not add driver.
20295	0x4F47	Can not remove driver.
20296	0x4F48	SP not primary or controlling.
20297	0x4F49	Mirror group name invalid characters.
20298	0x4F4A	LU participating in mirror.
20299	0x4F4B	Mirror Poll failed.

MirrorView/S error codes

Error value (decimal)	Error value (hexadecimal)	Description
20544	0x5040	Generic exception.
20545	0x5041	Mirror poll failed.
20546	0x5042	Mirror name length exceeds max.
20547	0x5043	Mirror name already used.
20548	0x5044	Mirror invalid number of LUs.
20549	0x5045	Mirror group name length exceeds maximum.
20550	0x5046	Mirror group name already used.
20551	0x5047	Mirror luns not ready.
20552	0x5048	Mirror secondary already exists.
20553	0x5049	Mirror secondary same as primary.
20554	0x504A	Mirror primary is rolling back.
20555	0x504B	Mirror group name invalid.
20556	0x504C	Mirror group description invalid.
20557	0x504D	WIL metalun not supported.

MirrorView consistency group error codes

Error value (decimal)	Error value (hexadecimal)	Description
21312	0x5340	The maximum number of groups is already defined.
21313	0x5341	Unable to locate the specified group.
21314	0x5342	The following group cannot be destroyed because it still has mirror members:
21315	0x5343	Unable to locate the specified mirror.
21316	0x5344	This mirror cannot be added to the group because it does not have exactly 1 secondary image.
21317	0x5345	Either the -remoteuid or -remoteaddress switch must be used because this mirror has more than 1 secondary image.
21318	0x5346	The remoteuid cannot be the same the array on which the group resides.
21319	0x5347	The mirror has no images on the specified remote array.

Error value (decimal)	Error value (hexadecimal)	Description
21320	0x5348	The mirror is already a member of a group, so it cannot be added to this one.
21321	0x5349	The remote image specified does not reside on the same array as the rest of the group's members.
21338	0x535A	Specified mirror is not a member of the group.
21339	0x535B	The specified missing mirror is not a member of the group.
21340	0x535C	Group name is already used.

iSCSI (connection) error codes

Error value (decimal)	Error value (hexadecimal)	Description
21280	0x5320	Invalid connection command.
21281	0x5321	Connection feature object is not available.
21282	0x5322	Connection enabling software is not installed.
21283	0x5323	Unexpected connection error occurred.

iSNS error codes

Error value (decimal)	Error value (hexadecimal)	Description
21456	0x53D0	Invalid iSNS command.
21457	0x53D1	iSNS feature object is not available.
21458	0x53D2	iSNS enabling software is not installed.
21459	0x53D3	iSNS unexpected errors occurred.

LUN migration error codes

Error value (decimal)	Error value (hexadecimal)	Description
21248	0x5300	Lun migration invalid command.
21249	0x5301	Lun migration feature not available.
21250	0x5302	Lun migration feature not supported.
21251	0x5303	Lun migration execute error.

Error value (decimal)	Error value (hexadecimal)	Description
21252	0x5304	Lun migration spec migration not available.
21253	0x5305	Lun migration spec source not available.
21254	0x5306	Lun migration base cannot be hot spare.
21255	0x5307	Lun migration dest not available.
21256	0x5308	Lun migration error code dest lu internal.
21257	0x5309	Lun migration error code dest lu external.

Arrayconfig error codes

Error value (decimal)	Error value (hexadecimal)	Description
21536	0x5420	CLI utility capture feature not available.
21537	0x5421	CLI-capture execute error.
21538	0x5422	Duplicate feature not available.
21539	0x5423	Duplicate execute error.
21540	0x5424	Invalid command.
25864	0x6508	Fix unavailable.
25865	0x6509	Rule exception.
25866	0x650a	Access level violation.
25867	0x650b	Dependencies not met.
25868	0x650C	Rule run exception.
25869	0x650D	Enumerate instances not supported.
25870	0x650E	Task still running.
25871	0x650F	Task limits reached.
25872	0x6510	Inconsistent packages.
25873	0x6511	Single task limit.

Event Monitor (emconfig) error codes

Error value (decimal)	Error value (hexadecimal)	Description
22272	0x5700	EMCONFIG code get usage.
22273	0x5701	EMCONFIG code invalid argument.

Error value (decimal)	Error value (hexadecimal)	Description
22274	0x5702	EMCONFIG code too few parameters.
22275	0x5703	EMCONFIG code too many parameters.
22276	0x5704	EMCONFIG code bad first option.
22277	0x5705	EMCONFIG code unknown option.
22278	0x5706	EMCONFIG code can load file.
22279	0x5707	EMCONFIG code inaccessible cmd.
22280	0x5708	EMCONFIG code not supported.
22281	0x5709	EMCONFIG code command not valid.
22282	0x570A	EMCONFIG code EMSA not found.
22283	0x570B	EMCONFIG code EMSA save config failed.
22284	0x570C	EMCONFIG code invalid template name.
22285	0x570D	EMCONFIG code classic subcmd parse success.
22286	0x570E	EMCONFIG code classic subcmd parse Failure.

MetaLUN error codes

Error value (decimal)	Error value (hexadecimal)	Description
19840	0x4D80	Invalid MetaLUN command.
19841	0x4D81	MetaLUN feature object is not available.
19842	0x4D82	MetaLUN feature is not enabled.
19843	0x4D83	Unexpected error occurred during MetaLUN command execution.
19844	0x4D84	Specified MetaLUN is not available.
19845	0x4D85	Specified base LU is not available.
19846	0x4D86	Specified LU is not available.
19847	0x4D87	Destroy multiple ALUs failed.
19848	0x4D88	Destroy multiple ALUs was only partially successful.

BAD block reporting (BRT) error plugin errors

Error value (decimal)	Error value (hexadecimal)	Description
22016	0x5600	BRT code not accessible.
22017	0x5601	Invalid not enough parameters.
22018	0x5602	BRT code invalid command.
22019	0x5603	BRT code invalid date format.
22020	0x5604	BRT code invalid end date.
22021	0x5605	BRT code no bad blocks.
22022	0x5606	BRT code output file could not be created.
22023	0x5607	BRT code invalid input file.
22024	0x5608	BRT code Invalid file could not be opened.
22025	0x5609	BRT code clean failed in LUNs.
22026	0x560a	BRT code error getting events.
22027	0x560b	BRT code incorrect input file.
22028	0x560c	BRT code unknown exception.
22029	0x560d	BRT code success with errors.
22030	0x560e	BRT code clean session timeout.

Storage group command error codes

Error value	Description
82	This version of the FLARE software does not support Access Logix (SAN or shared storage) systems.
83	The group name entered does not match any storage groups for this storage system.
84	The HBA UID specified is not known by the storage system.
85	The LUN number specified is not a bound LUN number.
86	Fairness not supported.
87	The retyped password does not match (case sensitivity not checked).
88	Server could not be found, or is not running an agent.
89	Invalid switch combination.
90	The UID (unique id) you entered does not match any storage groups for this storage system.
91	This version of FLARE software does not support the warm reboot feature.
92	Setpath cannot be used to map to the special default storage group.
93	Invalid number of disks in RAID group.
94	This version of FLARE software does not support the Dual Simultaneous Access.
95	This name identifies more than one storage group. Please identify the storage group that you wish to perform this operation on by providing its unique identifer(uid).
96	Inaccessible command.
97	New storage-system serial number must be a 12-character or less alphanumeric value.

Error value	Description
98	Cannot perform inquiry.
99	Cannot read block data.
100	Cannot write to file.
101	Cannot open pipe.
102	The host specified is not known by the storage system.
103	Network name size is too big.
104	Network admin not configured.
105	Not a privileged user.
106	Read only access.
176	Invalid contact information.
108	Invalid host description.
109	Invalid auto configuration.
110	Invalid privileged user list.
111	Invalid interval.
112	Invalid baud rate.
113	Invalid log size.
114	Invalid managed device.
115	Storage-system option not available.
116	Invalid megapoll value.
117	This version of agent does not support Remote Agent Configuration.
118	Invalid use of explicit device names value.
119	The valid value of baud rate is 9600 or 19200.

Error value	Description
120	This option is not supported.
121	Error while parsing file.
122	All of the specified users are already in the privileged user list.

SnapView and MirrorView error codes

For additional codes, see the CLI manual for your software.

Error value	Description
123	Snapshot does not exist.
124	This version of FLARE software does not support SnapView.
125	Invalid SP name.
126	Reserved LUN pool does not exist.
127	Package number invalid.
128	This version of FLARE software does not support nondisruptive software installation (NDU).
129	Cannot open this file.
130	File does not exist.
131	RAID type must be r1 (RAID 1), r3 (RAID 3), r5 (RAID 5), or r1_0 (RAID1/0).
132	Multiple subcommands specified. Check syntax.
133	Disk for PSM must be on DPE bus 0.
134	Configuration does not exist.
135	Configuration already exists.
136	Size specified is too small.
137	Configuration does not exist. Run the navicli initializearray command to configure the system.
138	First option must be a subcommand.
139	Cannot create RAID group for PSM (Persistent Storage Manager).
140	Name or UID (unique ID) is required.

Error value	Description
141	Invalid name specified.
142	Image UID is required.
143	Name and LUN are required.
144	Storage-system UID (unique ID) and LUN UID are required.
145	Mirror not found.
146	Image not found.
147	Synchronized rate cannot be changed since input image is primary.
148	Name and UID both specified.
149	Invalid reserved LUN pool.
150	Invalid session.
151	Session does not exist.
152	Session is stopping.
153	Invalid snapshot.
154	Snapshot does not exist.
155	The -o option requires '-all' or '-filename'.
156	Path to store files is required.
157	Cannot specify both '-all' and '-filename'.
158	Enter file index or 'quit'.
159	Invalid input.
160	Index is out of range.
161	File not found.
162	Space not available to retrieve file.

Error value	Description
163	Specified feature not supported.
164	Feature must be specified.
165	Cannot specify both '-lun' and '-lunuid' .
166	Invalid storage processor name.
167	PSM (Persistent Storage Manager) is not broken.
168	PSM (Persistent Storage Manager) is broken. Cannot list or create PSM.
169	LUN cannot be unbound.
170	Operation not supported on this type of storage system.
171	Incompatible arguments. Invalid storage-system serial number.
172	Directory not specified.
173	Invalid number of blocks.
174	Number of blocks not specified.
175	Reading of data not supported on this storage system.
176	Invalid snapshot World Wide Name (WWN).
177	Invalid storage-system serial number.
178	Navicli '-f' option required to store data in file.
179	Invalid IP address format.
180	Storage group cannot be shared.
181	Invalid HLU number.
182	Invalid ALU number.
183	Invalid port ID.
184	Remote server cannot be managed.

Error value	Description
185	Email response test failed.
186	Emailpage response test failed.
187	Modempage response test failed.
188	SNMP response test failed.
189	Phone home response test failed.
190	Mandatory switch for email/emailpage.
191	Mandatory switch for modempage.
192	Mandatory switch for SNMP.
193	Only one message or file can be specified.
194	Valid dial string contains only digits, parentheses, hyphen.
195	File does not exist or cannot open.
196	Specified user already exists.
197	The offset switch is not supported for this storage system.
198	Valid COM port number is 1,2,3,or 4.
199	Valid dial command is atd, atDp or atD.
200	Valid message delay contains only ",,," (one or more commas).
202	Target LUN number is missing.
203	Session name is missing.
204	SnapView multiple session feature is not supported.
205	Cannot specify both snapshot name and snapshot ID.
206	Cannot specify both -mode and -simulation.
207	This command is not supported on remote host.

Error value	Description
208	Switch -pathname must be specified.
209	Get local server attributes failed.
210	This version of FLARE software does not support Hi5 RAID type.
211	Only one of the switches -snapshotid, -snapshotname, or -lun can be specified.
212	Specified session and snapshot must be based on the same target LUN.
213	Cannot add LUN to reserved LUN pool; the maximum number of reserved LUNs has been allocated.
214	Cannot add LUN to reserved LUN pool; the maximum number of reserved LUNs that can be added is n.
215	The HLU (host LUN) number you specified cannot be found.
216	This command must be issued from the SP to which the LUN will trespass.
217	Invalid bus or enclosure number.
218	Invalid WWN seed.
219	Invalid EMC part number.
220	This RAID group has maximum number of LUNs already.
221	Not enough reserved LUNs in the specified SP's reserved LUN pool.
222	This LUN cannot be added to the Storage Group since it is participating in a remote mirror.
223	Allocate log must specify LUN with valid owner.
224	This request has been issued through the SP that is not the current owner of the targeted LUN.
226	Invalid NDB password.

Error value	Description
227	Insert test event failed.
228	The -addroffset switch is supported only for a non-destructive bind.
229	The -addroffset switch must be supplied for a non-destructive bind.
230	Cannot unbind LUN, PSM LUN that is not double faulted.
231	Cannot unbind LUN because it is in use as an active hot spare.
232	Cannot unbind LUN because a feature of the storage system is using it.
233	Cannot unbind LUN because it is contained within a storage group.
234	Incorrect LUN in storage group.
235	Cannot display LUN WWNs and update LUN map information at the same time.
236	The DMF is not supported.
237	Incorrect parameters while creating DMF.
238	Incorrect Name and UID specified for the DMF.
239	It is required to enter Name or UID for the DMF.
240	The specified DMF is removed, the destination does not exist.
241	Incorrect destination LUN WWN and number specified.
242	DMF name is not unique.
243	Unknown Descriptor for DMF.
244	Incorrect List and Set specified for DMF.
245	Throttle switch for DMF is missing.

Error value	Description
246	Throttle switch for DMF is invalid.
247	Invalid Max value for DMF.
248	Invalid poll value for DMF.
249	Incorrect source LUN, WWN and Number specified.
250	The destination for DMF is less than the source.
251	The peer SP is alive.
252	The DMF specified is neither Source nor destination.
253	The specified descriptor name for DMF is duplicate.
254	Duplicate. LUN ID for DMF.
255	The destination DMF exists.
256	DMF copy length is zero.
257	Source specified for DMF is a private LUN.
258	Destination specified for DMF is a private LUN.
259	DMF Modify destination is smaller than source.
260	DMF source specified is not on peer.
261	DMF destination specified is not on peer.
262	SNAP Rollback is not supported.
263	Flush rate is missing for SNAP.
264	Flush rate for SNAP is invalid.
265	SNAP session is not rolling back.
266	SNAP session is not persistent.
267	SNAP session is rolling back.
268	SNAP session source is rolling back.

Error value	Description
269	SNAP session has max.
270	SNAP has invalid session name.
271	Simulation is not supported.
272	SNAP chunk size is not changeable.
273	Session is rolling back, can not stop.
274	Session is rolling back can not activate.
275	Session is rolling back can not deactivate.
276	Mirrors with same name.
277	Error: -phonehome response test is not supported on the targeted agent. Please use -ipconnecthome or -mdmconnec-thome instead.
278	Response using modem from agent on SP is not supported.
279	Error: -ipconnecthome response test failed.
280	Error: -ipconnecthome is not supported.
281	Error: -mdmconnecthome response test failed.
282	Error: -mdmconnecthome is not supported.
283	Error: -connecto and -routerip are mandatory.
284	Error: -modemnum, -connectto, and -method are mandatory.
285	Error: -smtpmailserver, -destaddress, and -serialnumber are mandatory.
286	Error: -emailhome response test failed.
287	Error: invalid modem method. Valid method should be one of \"Direct Dial\", \"UUNET WAN\", \"UUNET SYM\", \"UUNET EQN\", \"UUNET JTO\", \"UUNET EQT\", \"UUNET GEN\",\"UUNET GRC\" and case sensitive.
288	Cannot add a hot spare to a storage group.

Error value	Description
289	Chglun parameter not supported on a non-FLARE LUN.
290	Unable to bind the metaLUN, use CLE command metalun -destroy instead.
291	This version of FLARE software does not support getsniffer or setsniffer on metaLUNs.
292	You must issue this command from the SP that owns the LUN on which the verfiy will be run.
293	Cannot specify both -feature and -featurename.
294	Snap_sp_does_not_own_session
295	Snap_sp_does_not_own_snapshot
296	Snap_inactive_snapshot
297	Snap_invalid_snapshot_name
298	Snap_bad_lun_for_snapshot
299	dmf_invalid_lun_or_slu
300	dmf_invalid_sp_name
301	Dmf_dupl_isc_not_supported
302	Dmf_command_not_supported_on_isc
303	Dmf_cannot_mark_if_marked
304	Dmf_cannot_unmark_if_unmarked
305	Dmf_err_nomark_if_marked
306	Dmf_err_copywholelun_if_marked
307	Dmf_err_isc_srclun_not_on_sp
308	Dmf_err_isc_snap_src
309	Dmf_changesonly_isc_not_supported

Error value	Description
310	Dmf_copywholelun_isc_not_supported
311	Dmf_nomark_isc_not_supported
312	Dmf_chgtype_invalid_value
313	Dmf_both_switches_error
314	Dmf_nomark_invalid_value
315	Dmf_isc_not_supported
316	Dmf_invalid_linkbw_value
317	Dmf_invalid_linkbw_value_range
318	Dmf_invalid_latency_value
319	Dmf_invalid_granularity_value
320	Dmf_create_isc_params
321	Dmf_modify_isc_params
322	Dmf_isc_name_change
323	Dmf_non_isc_latency_change
324	Dmf_non_isc_granularity_change
325	Dmf_non_isc_linkbw_change = 325,
326	Reserved_snap_sess_invalid_switch = 326,
327	Invalid switch specified for a reserved snap LUN.
328	Cannot activate reserved snapshot LUN.
329	Cannot deactivate reserved snapshot LUN.
330	Cannot stop a reserved session.
331	Cannot remove a reserved snapshot LUN.
332	Cannot modify a reserved snapshot LUN.

Error value	Description
333	Cannot start rollback on a reserved session.
334	Cannot change rollback session as it is reserved.
335	The format of decimal number specified is inappropriate.
336	Precision of the decimal number specified exceeds the maximum precision of n (where n varies depending upon the situation).
338	Cannot add a snapshot to storage group because the snapshot specified is reserved.
344	Use the -nolocal switch if agent version is not at least version 6.5 when setting SPS time.
345	Do not use the -nolocal switch if agent version is version 6.5 or greater when setting SPS time. This storage system does not support any NVRAM card.
346	This storage system does not support any NVRAM card.
347	This storage system does not support any operation on shutting down the array.
348	This storage system does not support any operation on LUN cache dirty condition.
349	Error parsing .lst file.
350	Cannot open .lst file.
351	Syntax error in .lst file.
352	Snap consistent start not supported.
353	The LUN list contains duplicate LUN number.
354	DMF Invalid Autorestart value.
355	Snap migration LUN for snap session.
356	Snap migration LUN for snapshot
357	Cannot port switches together.

Error value	Description
358	Snap no hotspare in addluntocache.
359	Snapshot name too long.
360	managedby not supported.
361	cachecard not supported.
362	Invalid SQ flags on AX.
363	DMF destination does not exist.
364	Invalid disk HA.
365	Invalid disks NONHA.
366	Can not access host.
367	DMF lite src not local.
368	DMF invalid port WWN.
369	DMF modify src multi switches
370	Port removedHBA logged in.
371	Luncache no cache dirty.
372	SG not connected to host.
373	Cannot unbind why double db fault.
374	Luncache not default owner.
375	Snap only persistent sessions.
376	DMF DESTPORTWWN DESTWWN and DESTLUN specified.
377	Need add audit.
378	No luns in RG.
379	RG does not exist.

Error value	Description
380	SIW rules failed.
381	No luns owned by target in RG.
382	No luns owned by target.
383	Remove RG duplicate Raid group number.
384	No sniff hot spare.
385	SIW jre not found.
386	SIW rules security.
387	RAID RebootPeerSP command.
388	Unknown SIW error.
389	Illegal error.
390	SIW rules login failed.
391	Resume not supported.
392	RAID reset and hold command.
393	Invalid parity elements hold value.
394	Invalid disk FW.
395	Snapcopy globalcache not committed.
396	Snapcopy globalcache not supported.
397	Non redundant RAID group.
398	Disk not found.
399	Reserved snap can not add lun private.
400	Reserved snap maximum allowed is exceeded.
401	Invalid RG type flags.
402	RAID type supported.

Error value	Description
403	RAID type not supported.
404	RAID type and disk unmatched.
405	Numbers disk even.
406	Invalid Rg type flags 2.
407	DMF name and descriptorID specified.
408	Snap remove active snapshot.
409	Snap active snapshot.
410	The destination LUN does not exist.
411	The same connection type specified.
412	Invalid storage group name.
413	Invalid connection.
414	Remote subsystem cannot be retrieved.
415	Duplicate switches.
416	Maximum of 240 characters allowed.
417	Values not numeric.
418	Inserting event failed.
419	Invalid speed request.
420	Invalid speed duplex.
421	Must be an IPv6 address in colon hexadecimal format.
422	No SP ports.
423	Duplicate disks.
424	Secure CLI executable not found.
425	Cannot_unbind_thinlun

Error value	Description
426	Switch_not_supported_metalun
427	Switch_not_supported_thinlun
428	rg_is_private
429	Eprivate_not_supported
430	Luncache_not_supported_metalun
431	Luncache_not_supported_thinlun
432	Not_support_sniffer_on_thinlun
433	Lun_is_in_use
434	Setfeature_sancopy_on_thinlun_not_supported
435	Netadmin_community_too_short
436	Netadmin_community_too_long

Feature command error codes

The following tables list decimal and hexadecimal values and descriptions of feature command errors, which includes mapped RAID errors, LUN migration errors, connection and iSNS (iSCSI) errors, and domain and security errors.

General feature command errors

Error value (decimal)	Error value (hexadecimal)	Description
19713	0x4D01	Error encountered during command execution.
19714	0x4D02	Invalid command entered.
19715	0x4D03	Command is running. Client should poll for status.

Mapped RAID errors

Error value (decimal)	Error value (hexadecimal)	Description
19840	0x4D80	Invalid metaLUN command.
19841	0x4D81	MetaLUN feature object is not available.
19842	0x4D82	MetaLUN feature is not enabled.
19843	0x4D83	Unexpected error occurred during metaLUN command execution.
19844	0x4D84	Specified metaLUN is not available.
19845	0x4D85	Specified base LU is not available.
19846	0x4D86	Specified LU is not available.
19847	0x4D87	Destroy multiple ALUs failed.
19848	0x4D88	Destroy multiple ALUs was only partially successful.

LUN migration errors

Error value (decimal)	Error value (hexadecimal)	Description
21248	0x5300	Invalid LUN migration command.
21249	0x5301	LUN migration feature object is not available.
21250	0x5302	LUN migration feature is not enabled.

Error value (decimal)	Error value (hexadecimal)	Description
21251	0x5303	Unexpected error occurred during metaLUN command execution.
21252	0x5304	LUN migration object not available.
21253	0x5305	LUN migration source LU is not available.
21254	0x5306	LUN migration base cannot be a hot spare.
21255	0x5307	LUN migration destination LU is not available.

Connection and iSNS (iSCSI) errors

Error value (decimal)	Error value (hexadecimal)	Description
21280	0x5320	Invalid connection command.
21281	0x5321	Connection feature object is not available.
21282	0x5322	Connection software is not enabled.
21283	0x5323	Unexpected error occurred during connection command execution.
21456	0x53D0	Invalid isns command.
21457	0x53D1	iSNS feature object is not available.
21458	0x53D2	iSNS enabling software is not installed.
21459	0x53D3	Unexpected error occurred during isns command execution.

Domain and security errors

Error value (decimal)	Error value (hexadecimal)	Description
21408	0x53A0	Invalid domain command.
21409	0x53A1	Domain feature object is not available.
21410	0x53A2	Unexpected error occurred during domain command execution.
21488	0x53F0	Security error code invalid command.
21489	0x53F1	Security error code feature not ava.
21490	0x53F2	Security error code execute error.
16492	0x406C	FIPS mode change before commit.
16493	0x406D	FIPS mode change failed.

Error value (decimal)	Error value (hexadecimal)	Description
16485	0x4065	navisec system user already exists.
16486	0x4066	navisec user scope role type mismatch.
16487	0x4067	navisec invalid account type value.
17200	0x4330	e navidir error recover control station failed.
17201	0x4331	e navidir error recover peersp failed.
17202	0x4332	e navidir error recover localsp failed.

Thin provisioning errors

Note: If parsing errors occur, the CLI displays the parameter and the error will appear in the following format, <Parameter Name>: <Error Message>

Error value (decimal)	Error value (hexadecimal)	Description
28049	0x6D91	Internal error. Rule input message could not be created. Please try again.
28050	0x6D92	The best practices check for the storage pool's creation did not finish successfully. The storage pool will not be created.
28051	0x6D93	Internal error. The reference names for some of the disks in the disks list could not be obtained. Please try again.
28052	0x6D94	This storage pool can't be destroyed because it has luns defined in it. Please destroy the luns and then destroy the storage pool.
28053	0x6D95	The best practices check for the storage pool's expansion did not finish successfully. The storage pool will not be expanded.
28054	0x6D96	Could not set properties:(%s). [Parameter 1: A comma separated list of the user visible names of all the properties that could not be set]
28055	0x6D97	The LUN ID list is empty. At least one LUN must be specified.
28056	0x6D98	The following LUNs could not be destroyed: (%s). Please make sure that all these LUNs exist, are private Flare LUNs and belong to the storage pool specified. [Parameter 1: A comma separated list of lun ids that could not be destroyed successfully]
28057	0x6D99	The RAID Group ID list is empty. At least one RAID Group must be specified.
28058	0x6D9A	The following RAID Groups could not be destroyed:(%s). Please make sure that all these RAID Groups exist, are private RAID Groups and belong to the storage pool specified. [Parameter 1: A comma separated list of RG ids that could not be destroyed successfully]
28059	0x6D9B	This command can be used only for Thin LUNs. LUN (%d) is not a Thin LUN. [Parameter 1: The id of the LUN]

Error value (decimal)	Error value (hexadecimal)	Description
28060	0x6D9C	One of the following messages: 1. Cannot unbind LUN because its a PSM LUN that is not double faulted. 2. Cannot unbind LUN because its in use as an active Hot Spare 3. Cannot unbind LUN because its being used by a feature of the Storage System 4. Cannot unbind LUN because its contained in a Storage Group 5. Cannot unbind LUN because the database drive is double faulted.
28061	0x6D9D	Unable to create default name for the Thin LUN. Thin LUN was not created. Please try creating the Thin LUN with the name parameter specified.
28288	0x6E80	Internal error. Could not retrieve: (%s) [Parameter 1: The user visible name of the object class]
28289	0x6E81	Internal error. Could not retrieve: (%s) [Parameter 1: The user visible name of the object class]
28290	0x6E82	Could not retrieve the specified (%s). The (%s) may not exist. [Parameter 1: the user visible name of the object class] [Parameter 2: Same as parameter 1]
28291	0x6E83	Internal error. Could not retrieve the specified (%s). The (%s) may not exist [Parameter 1: the user visible name of the object class] [Parameter 2: Same as parameter 1]
28293	0x6E85	Could not retrieve bus, enclosure and disk position information from:(%s) because the disk names are not in the expected format. [Parameter 1: The string which caused the error]
28294	0x6E86	The following disk could not be retrieved : (%s). [Parameter 1: the valid disk B_E_D string which was passed as input]

Error value (decimal)	Error value (hexadecimal)	Description
19720	0x4D08	Could not retrieve: (%s) [Parameter 1: The user visible name of the object class]
19721	0x4D09	Could not retrieve the specified (%s). The (%s) may not exist. [Parameter 1: the user visible name of the object class] [Parameter 2: Same as parameter 1]
19722	0x4D0A	Internal error. Could not retrieve the specified (%s). The (%s) may not exist [Parameter 1: the user visible name of the object class] [Parameter 2: Same as parameter 1]
19723	0x4D0B	Internal error. Unknown exception while parsing.
19719	0x4D07	This command uses unsupported options. Using these may cause normal system operation to be disrupted and may lead to a data unavailable/data lost (DU/DL) situation. Are you sure you want to perform this operation?(y/n):
19729	0x4D11	Unmatched quotes found: (%s). [Parameter 1: the string with the unclosed quotes]
19731	0x4D13	Internal error. Unable to finish parsing
19732	0x4D14	Internal error. Factory not initialized at (%s). [Parameter 1: the token at which the factory class change was tried]
19733	0x4D15	Internal error. Option handler not initialized at (%s). [Parameter 1: the token at which the option handlerwas not found]
19734	0x4D16	Internal error. Parameter handler not initialized at (%s). [Parameter 1: the token at which the parameter handler object was not found]
19735	0x4D17	Unrecognized option: (%s). [Parameter 1: the token which wasn't recognized as an option or a parameter of the previous option]

Error value (decimal)	Error value (hexadecimal)	Description
19736	0x4D18	String is too long.<Usage>
19737	0x4D19	String is too short.<Usage>
19738	0x4D1A	String contains characters that are not allowed.<Usage>
19739	0x4D1B	String %s has invalid pattern.<Usage> [Parameter 1: The string that has the wrong pattern]
19740	0x4D1C	Value (%s) out of range.Valid values are (whereeach value can be specified only once)*: (%s). The remaining valid values are (%s) [parameter 1: The string which is out of the valid list. Parameter 2: A comma separated list of valid string values Parameter 3: A comma separated list of valid string values that can still be used (in case duplication is not allowed *-->This statement in brackets appears only if duplication is not allowed while inputting the string values]
19741	0x4D1D	String (%s) starts with spaces. [Parameter 1: The string that starts with spaces]
19742	0x4D1E	String (%s) ends with spaces. [Parameter 1: The string that ends with spaces]
19743	0x4D1F	Internal error. Unknown pattern initialization
19744	0x4D20	Value %s is not numeric. [Parameter 1: The string that was supposed to be numeric]
19745	0x4D21	Value %llu is less than the minimum. The minimum value is %llu [parameter 1: the numeric value that's less than the minimum Parameter 2: the minimum acceptable numeric value]
19746	0x4D22	Value %llu is greater than maximum. The maximum value is %llu [Parameter 1: The numeric value that's greater than the maximum acceptable value

Error value (decimal)	Error value (hexadecimal)	Description
		Parameter 2: the maximum acceptable numeric value]
19749	0x4D25	At least one out of the following options should be specified:(%s). [Parameter 1: A comma separated list of options out of which at least one must be specified]
19750	0x4D26	At most one out of the following options should be specified: (%s). [Parameter 1: A comma separated list of options out of which at most one can be specified]
19751	0x4D27	Exactly one out of the following options must be specified: (%s). [Parameter 1: A comma separated list of options out of which exactly one can be specified]
19752	0x4D28	All of the following options must be specified: (%s). [Parameter 1: A comm a separated list of options, all of which must be specified]
19753	0x4D29	Too few parameters. At least %d parameters are required. [Parameter 1: The minimum number of acceptable parameters for an option]
19754	0x4D2A	Too many parameters. At most %d parameters can be given. [Parameter 1: The maximum number of acceptable parameters for an option]
19755	0x4D2B	Internal error. While parsing, unable to save value for: %s [Parameter 1: A comma separated list of values which had to be stored]

Autotiering and pool LUN errors

Error value	Description
0x6D20	Provisioning_autotiering_unknown_exception
0x6D21	Provisioning_autotiering_unsupported

Error value	Description
0x6D22	Provisioning_autotiering_max_schedules_reached
0x6D23	Provisioning_autotiering_invalid_start_offset
0x6D24	Provisioning_autotiering_invalid_duration
0x6D25	Provisioning_autotiering_invalid_day
0x6D26	Provisioning_autotiering_invalid_throttle
0x6D27	Provisioning_autotiering_psm_error
0x6D28	Provisioning_autotiering_schedule_not_found
0x6D29	Provisioning_autotiering_default_schedule_not_found
0x6D2A	Provisioning_autotiering_unsupported_schedule_class
0x6D2B	Provisioning_autotiering_navi_instance_not_found
0x6D2C	Provisioning_autotiering_psmerror_flare_uncommitted
0x6D2D	Provisioning_autotiering_instancename_ie
0x6D2E	Provisioning_autotiering_system_init_ie
0x6D2F	Provisioning_autotiering_invalid_tasktype
0x6D30	Provisioning_autotiering_pe_capabilities_unavailable
0x6D31	Provisioning_autotiering_invalid_pool_index
0x6D32	Provisioning_autotiering_invalid_task_index
0x6D33	Provisioning_autotiering_invalid_tier_index
0x6D34	Provisioning_autotiering_pool_not_found
0x6D35	Provisioning_autotiering_missing_required_argument
0x6D36	Provisioning_autotiering_addpool_partial_success
0x6D37	Provisioning_autotiering_addpool_failed
0x6D38	Provisioning_autotiering_removepool_partial_success
0x6D39	Provisioning_autotiering_removepool_failed
0x6D3A	Provisioning_autotiering_psm_db_mismatch
0x6D3B	Provisioning_autotiering_max_scheduled_obj_reached
0x6D3C	Provisioning_autotiering_get_tier_drives_failed
0x6D3D	Provisioning_autotiering_schedname_len_exceeds_max
0x6D3E	Provisioning_autotiering_del_def_sched_not_allowed
0x6D3F	Provisioning_autotiering_no_def_sched_case

Error value	Description
0x6D7F	Provision_invalid_rules_xml
0x6DBC	Provision_navi_pool_instance_not_found
0x6DBD	Provision_task_not_found
0x6DBE	Provision_pool_must_be_inactive
0x6DBF	Provision_thinpool_unable_to_set_efdcache
0x7240	Alert name: Alert_autotiering_scheduled_relocation_failed
0x7468	Alert_faulted_missing_critical_disk
0x7469	Alert_faulted_critical_foreign_disks
0x7481	Alert_faulted_critical_disk
0x7482	Alert_faulted_foreign_disk
0x7486	Alert_mlun_recovery_required
0x7487	Alert_mlun_expand_failed
0x7488	Alert_mlun_shrink_failed

Event Monitor errors

Error value (hexadecimal)	Description
0x5460	Info
0x5461	Execute error
0x5462	Feature not ava
0x5463	No system
0x5464	No portal
0x5465	No host agent
0x5466	Portal config already assigned
0x5467	No portal config
0x5468	Portal config not highest version
0x5469	No centralized monitor
0x546A	No distributed monitor
0x546B	No emsa
0x546C	Illegal template name

Error value (hexadecimal)	Description
0x546D	Template already exist
0x546E	Template not applied
0x546F	System not monitored
0x5470	Cannot get emsa config
0x5471	Cannot update emsa config
0x5472	New template name exist in database
0x5473	New template name exist in config
0x5474	Cannot delete call home template
0x5481	Invalid command
0x5482	Illegal template file
0x5483	Cannot upload file
0x5484	Cannot download file
0x5485	No file path
0x5486	Template file already exist

Virtual Server CLI errors

Error value (hexadecimal)	Description
0x7800	Esx success
0x7801	Esx failure
0x7802	Vc success
0x7803	Vc failure
0x7804	Agent success
0x7805	Agent failure
0x7806	Unknown exception
0x7807	Read virtual cfg from psm failure
0x7808	Poll servers failure
0x7809	Poll servers success
0x780a	Init virtual cfg in psm failure
0x780b	Connection failure not vmware vc
0x780c	Connection failure not vmware esx

Error value (hexadecimal)	Description
0x780d	Poll vmware esx autopush success
0x780e	Poll vmware esx autopush failure
0x7900	Command not supported
0x7901	No esx server connection
0x7902	Server does not exist.
0x7903	Not a Virtual Center.

Compression errors

Error value	Description
0x7A00	Compression_error_feature_paused
0x7A01	Compression_error_feature_not_paused
0x7A02	Compression_error_feature_not_enabled
0x7A03	Compression_error_lun_not_exist
0x7A04	Compression_error_lun_not_compressed
0x7A05	Compression_error_lun_already_compressed
0x7A06	Compression_error_cannot_compress_migrating_lun
0x7A07	Compression_error_cannot_migrate
0x7A08	Compression_error_unsupported_lun_type
0x7A09	Compression_error_session_not_paused
0x7A0A	Compression_error_session_already_paused
0x7A0B	Compression_error_cannot_compress
0x7A0C	Compression_error_session_initializing
0x7A0D	Compression_error_session_faulted
0x7A0E	Compression_error_session_migrating_faulted
0x7A0F	Compression_error_invalid_compression_rate
0x7A10	Compression_error_migration_faulted
0x7A11	Compression_error_compressin_faulted
0x7A12	Compression_error_dest_pool_needed_for_tradtional_lun
0x7A13	Compression_error_dest_pool_not_allowed_for_pool_lun
0x7A14	Compression_error_dest_pool_not_found

Error value	Description
0x7A15	Compression_error_wrong_dest_pool_for_pool_lun
0x7A17	Compression_error_override_system_pause_not_allowed
0x7A18	Compression_error_cannot_pause
0x7A19	Compression_error_cannot_pause_migration
0x7A1A	Compression_error_cannot_compress_private_lun
0x7A1B	Compression_error_cannot_compress_binding_lun
0x7A1C	Compression_error_cannot_compress_transitioning_lun
0x7A1D	Compression_error_too_many_thin_luns
0x7A1E	Compression_error_too_many_compression_sessions
0x7A1F	Compression_error_already_overridden
0x7A80	Compression_error_internal

FAST Cache error

Error value	Description
0x7B80	fc_error_no_disks
0x7B81	fc_error_disks_unequal_capacities
0x7B82	fc_error_disk_duplicates
0x7B83	fc_error_unsupported_configuration
0x7B84	fc_error_efds_unavailable
0x7B85	fc_error_feature_not_enabled
0x7B86	fc_error_no_valid_cache_modes
0x7B87	fc_error_no_valid_raid_types
0x7B88	fc_error_no_valid_disk_counts
0x7B89	fc_error_no_valid_efds
0x7B8A	fc_error_no_efds_available
0x7B8B	fc_error_cmd_running_or_failed
0x7B8C	fc_error_fc_already_created
0x7238	FAST Cache Hot Spare Not Available
0x7477	Alert_fcache_creation_failed
0x7478	Alert_fcache_destroy_failed

Error value	Description
0x7479	Alert_fcache_thinpool_modification_failed

Appendix B

Secure CLI Command Coverage

This appendix provides a list of commands that are supported by Secure CLI on various systems. The version number indicates the earliest Navisphere version that supported the command for each system type. Unless specified, the command will be supported on all subsequent releases. The commands that are not supported on specific systems are also listed.

Secure CLI Command coverage

Table 34. EMC® VNX® Navisphere CLI

Command	CX series	CX3 series	CX4 series	AX4-5 Manager	AX4-5 Express	Comments
alpa -get	6.19	6.22	6.28	6.23	N/A	Not supported on iSCSI storage system
alpa -set	6.19	6.22	6.28	N/A	N/A	
arraycommpath	6.19	6.22	6.28	6.23	N/A	
arrayconfig -capture	6.26	6.26	6.28	N/A	N/A	
arrayconfig -duplicate	6.26	6.26	6.28	N/A	N/A	
arrayname	6.19	6.22	6.28	6.23	6.23	
backendbus -analyze	N/A	6.22	6.28	N/A	N/A	
backendbus -get -speeds	N/A	6.22	6.28	N/A	N/A	
backendbus -get -sfpstate	N/A	6.22	6.28	N/A	N/A	
backendbus -get -physical	N/A	6.22	6.28	N/A	N/A	
backendbus -get -all	N/A	6.22	6.28	N/A	N/A	
backendbus -resetspeed	N/A	6.22	6.28	N/A	N/A	
baseuuid	6.19	6.22	6.28	N/A	N/A	
bind	6.19	6.22	6.28	6.23	6.23	

Table 34. EMC® VNX® Navisphere CLI
(continued)

Command	CX series	CX3 series	CX4 series	AX4-5 Manager	AX4-5 Express	Comments
cachecard -initialize	N/A	N/A	N/A	N/A	N/A	
cachecard -list	N/A	N/A	N/A	N/A	N/A	
chglun	6.19	6.22	6.28	6.23	6.23	This command does not support thin LUNs.
chgrg	6.19	6.22	6.28	6.23	6.23	This command does not support private RAID groups used in thin pools.
clearlog	6.19	6.22	6.28	6.23	6.23	
clearstats	6.19	6.22	6.28	N/A	N/A	
cmdtime	6.19	6.22	6.28	N/A	N/A	
copytohotspare	6.26	6.26	6.26	N/A	N/A	Not supported on AX4-5 series
createrg	6.19	6.22	6.28	6.23	N/A	
emconfiguration	6.19	6.22	6.28	6.23	6.23	
failovermode	6.19	6.22	6.28	6.23	N/A	
faults -list	6.19	6.22	6.28	6.23	6.23	
firmware	6.19	6.22	6.28	N/A	N/A	
flash -ioport	N/A	N/A	6.28	N/A	N/A	
flash -iomodule	N/A	N/A	6.28	N/A	N/A	
flashleds	6.19	6.22	6.28	6.23	6.23	

Table 34. EMC® VNX® Navisphere CLI
(continued)

Command	CX series	CX3 series	CX4 series	AX4-5 Manager	AX4-5 Express	Comments
getagent	6.19	6.22	6.28	6.23	6.23	
getall	6.19	6.22	6.28	6.23	6.23	
getarrayuid	6.19	6.22	6.28	6.23	6.23	
getcache	6.19	6.22	6.28	6.23	6.23	
getconfig	6.19	6.22	6.28	6.23	6.23	
getcontrol	6.19	6.22	6.28	6.23	6.23	
getcrus	6.19	6.22	6.28	6.23	6.23	
getdisk	6.19	6.22	6.28	6.23	6.23	
getlog	6.19	6.22	6.28	6.23	6.23	
getloop	6.19	6.22	6.28	6.23	6.23	
getlun	6.19	6.22	6.28	6.23	6.23	
getresume	6.19	6.22	6.28	6.23	6.23	
getrg	6.19	6.22	6.28	6.23	6.23	
getsniffer	6.19	6.22	6.28	N/A	N/A	This command does not support thin LUNs.
getsp	6.19	6.22	6.28	N/A	N/A	
getsptime	6.19	6.22	6.28	N/A	N/A	
getunusedluns	6.19	6.22	6.28	N/A	N/A	
inserttestevent	6.19	6.22	6.28	N/A	N/A	
ioportconfig -list	N/A	N/A	6.28	N/A	N/A	

Table 34. EMC® VNX® Navisphere CLI
(continued)

Command	CX series	CX3 series	CX4 series	AX4-5 Manager	AX4-5 Express	Comments
ioportconfig -persist	N/A	N/A	6.28	N/A	N/A	
luncache -clear	6.19	6.22	6.28	6.23	6.23	This command does not support thin LUNs.
luncache -list	6.19	6.22	6.28	6.23	6.23	This command does not support thin LUNs.
managedby	6.19	6.22	6.28	N/A	N/A	
managefiles -delete	6.19	6.22	6.28	N/A	N/A	
managefiles -list	6.19	6.22	6.28	N/A	N/A	
managefiles -retrieve	6.19	6.22	6.28	N/A	N/A	
ndu -list	6.19	6.22	6.28	N/A	N/A	
ndu -install	6.19	6.22	6.28	N/A	N/A	
ndu -runrules	6.19	6.22	6.28	N/A	N/A	
ndu -commit	6.19	6.22	6.28	N/A	N/A	
ndu -status	6.19	6.22	6.28	N/A	N/A	
ndu -revert	6.19	6.22	6.28	6.23	N/A	
networkadmin -get	6.19	6.22	6.28	6.23	6.23	
networkadmin -mib	6.19	6.22	6.28	6.23	6.23	
networkadmin -route	N/A	N/A	6.29	N/A	N/A	

Table 34. EMC® VNX® Navisphere CLI
(continued)

Command	CX series	CX3 series	CX4 series	AX4-5 Manager	AX4-5 Express	Comments
networkadmin -set	6.19	6.22	6.28	6.23	6.23	
port	6.19	6.22	6.28	N/A	N/A	
powersaving	N/A	N/A	6.29	N/A	N/A	
rebootSP	6.19	6.22	6.28	6.23	6.23	
rebootpeerSP	N/A	24	6.28	6.23	6.23	AX150 series also supports this command.
register	6.19	6.22	6.28	N/A	N/A	
remoteconfig -getconfig	6.19	6.22	6.28	N/A	N/A	Not supported on AX4-5 series
remoteconfig -reloadconfig	6.19	6.22	6.28	N/A	N/A	
remoteconfig -setconfig	6.19	6.22	6.28	N/A	N/A	
removerg	6.19	6.22	6.28	N/A	N/A	
resetandhold	6.19	6.22	6.28	N/A	N/A	
responsetest	6.19	6.22	6.28	N/A	N/A	
sc_off	6.19	6.22	6.28	N/A	N/A	
setcache	6.19	6.22	6.28	6.23	N/A	
setfeature	6.19	6.22	6.28	N/A	N/A	
setsniffer	6.19	6.22	6.28	N/A	N/A	This command does not support thin LUNs.
setspstime	6.19	6.22	6.28	N/A	N/A	

Table 34. EMC® VNX® Navisphere CLI
(continued)

Command	CX series	CX3 series	CX4 series	AX4-5 Manager	AX4-5 Express	Comments
setsptime	6.19	6.22	6.28	N/A	N/A	
setstats	6.19	6.22	6.28	N/A	N/A	CX series only
shutdown	6.19	6.22	N/A	N/A	N/A	AX4-5 series and AX series only
shutdownsp	6.19	6.22	6.28	N/A	N/A	AX4-5 series and CX4 series only
shutdownpeersp	6.19	6.22	6.28	N/A	N/A	AX4-5 series and CX4 series only
spcollect -info	6.19	6.22	6.28	N/A	N/A	AX4-5 series and CX4 series only
spcollect -set	6.19	6.22	6.28	N/A	N/A	
spcollect	6.19	6.22	6.28	N/A	N/A	
spportspeed	6.19	6.22	6.28	N/A	N/A	
systemtype	6.19	6.22	6.28	6.23	N/A	AX4-5 series running Unisphere and CX series only
storagegroup	6.19	6.22	6.28	N/A	N/A	
trespass	6.19	6.22	6.28	N/A	N/A	
unbind	6.19	6.22	6.28	N/A	N/A	
unitserialnumber	6.19	6.22	6.28	N/A	N/A	
metalun-destroy	6.19	6.22	6.28	N/A	N/A	

Table 34. EMC® VNX® Navisphere CLI
(continued)

Command	CX series	CX3 series	CX4 series	AX4-5 Manager	AX4-5 Express	Comments
metalun -expand	6.19	6.22	6.28	N/A	N/A	
metalun -info	6.19	6.22	6.28	N/A	N/A	
metalun -list	6.19	6.22	6.28	N/A	N/A	
metalun -modify	6.19	6.22	6.28	N/A	N/A	
reserved -lunpool -addlun	6.19	6.22	6.28	6.23	6.23	This command does not support the thin LUNs.
reserved -lunpool -list	6.19	6.22	6.28	6.23	6.23	This command does not support the thin LUNs.
reserved -lunpool -rmlun	6.19	6.22	6.28	6.23	6.23	This command does not support the thin LUNs.
connection -adduser	6.19	6.22	6.28	6.23	6.23	
connection -deleteuser	6.19	6.22	6.28	6.23	6.23	
connection -getuser	6.19	6.22	6.28	6.23	6.23	
connection -getport	6.19	6.22	6.28	6.23	6.23	
connection -setport	6.19	6.22	6.28	6.23	6.23	
connection -delport	N/A	N/A	6.29	N/A	N/A	

Table 34. EMC® VNX® Navisphere CLI
(continued)

Command	CX series	CX3 series	CX4 series	AX4-5 Manager	AX4-5 Express	Comments
connection -route	N/A	N/A	6.29	N/A	N/A	
connection -pingnode	6.19	6.22	6.28	6.23	6.23	
connection -traceroute	6.19	6.22	6.28	6.23	6.23	
connection -setsharedauth	6.26	6.22	6.28	6.23	6.23	
connection -delsharedauth	6.26	6.22	6.28	6.23	6.23	
connection -getsharedauth	6.26	6.22	6.28	6.23	6.23	
connection -addset	6.26	6.22	6.28	6.23	6.23	
connection -delset	6.26	6.22	6.28	6.23	6.23	
connection -modifyset	6.26	6.22	6.28	6.23	6.23	
connection -getset	6.26	6.22	6.28	6.23	6.23	
connection -addpath	6.26	6.22	6.28	6.23	6.23	
connection -delpath	6.26	6.22	6.28	6.23	6.23	
connection -modifypath	6.26	6.22	6.28	6.23	6.23	
connection -verifypath	6.26	6.22	6.28	6.23	6.23	

Table 34. EMC® VNX® Navisphere CLI
(continued)

Command	CX series	CX3 series	CX4 series	AX4-5 Manager	AX4-5 Express	Comments
isns -addserver	6.19	6.22	6.28	6.23	6.23	
isns -deleteserver	6.19	6.22	6.28	6.23	6.23	
isns -listserver	6.19	6.22	6.28	6.23	6.23	
isns -setprimary	6.19	6.22	6.28	6.23	6.23	
migrate -start	6.19	6.22	6.28	6.23	N/A	
migrate -cancel	6.19	6.22	6.28	6.23	N/A	
migrate -modify	6.19	6.22	6.28	6.23	N/A	
migrate -list	6.19	6.22	6.28	6.23	N/A	
domain -add	6.19	6.22	6.28	6.23	N/A	
domain -list	6.19	6.22	6.28	6.23	N/A	
domain -remove	6.19	6.22	6.28	6.23	N/A	
domain -setmaster	6.19	6.22	6.28	6.23	N/A	
ntp -list	6.26	N/A	6.28	N/A	N/A	
ntp -set	6.26	N/A	6.28	N/A	N/A	
security -adduser	6.19	6.22	6.28	6.23	N/A	
security -changeuserinfo	6.19	6.22	6.28	6.23	N/A	
security -list	6.19	6.22	6.28	6.23	N/A	
security -listrole	6.19	6.22	6.28	6.23	N/A	

Table 34. EMC® VNX® Navisphere CLI
(continued)

Command	CX series	CX3 series	CX4 series	AX4-5 Manager	AX4-5 Express	Comments
security -rmuser	6.19	6.22	6.28	6.23	N/A	
security -ldap -addserver	N/A	N/A	6.29	N/A	N/A	
security -ldap -modifyserver	N/A	N/A	6.29	N/A	N/A	
security -ldap -removeserver	N/A	N/A	6.29	N/A	N/A	
security -ldap -listserver	N/A	N/A	6.29	N/A	N/A	
security -ldap -addrolemapping	N/A	N/A	6.29	N/A	N/A	
security -ldap -modifyrolemapping	N/A	N/A	6.29	N/A	N/A	
security -ldap -removerolemapping	N/A	N/A	6.29	N/A	N/A	
security -ldap -listrolemapping	N/A	N/A	6.29	N/A	N/A	
security -ldap -synchronize	N/A	N/A	6.29	N/A	N/A	
security -ldap -bypasscerts	N/A	N/A	6.30	N/A	N/A	
security -certificate -add	N/A	N/A	6.30	N/A	N/A	
security -certificate -remove	N/A	N/A	6.30	N/A	N/A	

Table 34. EMC® VNX® Navisphere CLI
(continued)

Command	CX series	CX3 series	CX4 series	AX4-5 Manager	AX4-5 Express	Comments
security -certificate -list	N/A	N/A	6.30	N/A	N/A	
security -certificate -alertBeforeExpiration	N/A	N/A	6.30	N/A	N/A	
storagepool -create	N/A	N/A	6.28	N/A	N/A	
storagepool -list	N/A	N/A	6.28	N/A	N/A	
storagepool -destroy	N/A	N/A	6.28	N/A	N/A	
storagepool -modify	N/A	N/A	6.28	N/A	N/A	
storagepool -expand	N/A	N/A	6.28	N/A	N/A	
storagepool -cancelexpand	N/A	N/A	6.28	N/A	N/A	
storagepool -feature -info	N/A	N/A	6.30	N/A	N/A	
thinlun -create	N/A	N/A	6.28	N/A	N/A	
thinlun -list	N/A	N/A	6.28	N/A	N/A	
thinlun -modify	N/A	N/A	6.28	N/A	N/A	
thinlun -destroy	N/A	N/A	6.28	N/A	N/A	
thin -info	N/A	N/A	6.28	N/A	N/A	
lun -create	N/A	N/A	6.30	N/A	N/A	
lun -modify	N/A	N/A	6.30	N/A	N/A	
lun -expand	N/A	N/A	6.30	N/A	N/A	

Table 34. EMC® VNX® Navisphere CLI
(continued)

Command	CX series	CX3 series	CX4 series	AX4-5 Manager	AX4-5 Express	Comments
lun -destroy	N/A	N/A	6.30	N/A	N/A	
lun -list	N/A	N/A	6.30	N/A	N/A	
-portal -create	N/A	N/A	6.29	N/A	N/A	
-portal -list	N/A	N/A	6.29	N/A	N/A	
-portal -migrate	N/A	N/A	6.29	N/A	N/A	
-portal -destroy	N/A	N/A	6.29	N/A	N/A	
-template -list	N/A	N/A	6.29	N/A	N/A	
-template -import	N/A	N/A	6.29	N/A	N/A	
-template -export	N/A	N/A	6.29	N/A	N/A	
-template -destroy	N/A	N/A	6.29	N/A	N/A	
-template -findconflict	N/A	N/A	6.29	N/A	N/A	
-template -swap	N/A	N/A	6.29	N/A	N/A	
-monitor -addsystem	N/A	N/A	6.29	N/A	N/A	
-monitor -removesystem	N/A	N/A	6.29	N/A	N/A	
-monitor -listmapping	N/A	N/A	6.29	N/A	N/A	
-monitor -applytemplate	N/A	N/A	6.29	N/A	N/A	

Table 34. EMC® VNX® Navisphere CLI
(continued)

Command	CX series	CX3 series	CX4 series	AX4-5 Manager	AX4-5 Express	Comments
-monitor -stoptemplate	N/A	N/A	6.29	N/A	N/A	
-monitor -getlog	N/A	N/A	6.29	N/A	N/A	
-monitor -enableresponse	N/A	N/A	6.29	N/A	N/A	
-monitor -disableresponse	N/A	N/A	6.29	N/A	N/A	
-monitor -getlogsize	N/A	N/A	6.29	N/A	N/A	
-monitor -setlogsize	N/A	N/A	6.29	N/A	N/A	
-monitor -inserttestevent	N/A	N/A	6.29	N/A	N/A	
-monitor -responsetest	N/A	N/A	6.29	N/A	N/A	
-monitor -reloadconfig	N/A	N/A	6.29	N/A	N/A	
server -volmap	N/A	N/A	6.29	N/A	N/A	
server -update	N/A	N/A	6.29	N/A	N/A	
server -getagent	N/A	N/A	6.29	N/A	N/A	
server -remoteconfig	N/A	N/A	6.29	N/A	N/A	
server -register	N/A	N/A	6.29	N/A	N/A	
hypervisor -addvirtualcenter	N/A	N/A	6.29	N/A	N/A	

Table 34. EMC® VNX® Navisphere CLI
(continued)

Command	CX series	CX3 series	CX4 series	AX4-5 Manager	AX4-5 Express	Comments
hypervisor -modifyvirtualcenter	N/A	N/A	6.29	N/A	N/A	
hypervisor -removevirtualcenter	N/A	N/A	6.29	N/A	N/A	
hypervisor -addESX	N/A	N/A	6.29	N/A	N/A	
hypervisor -modifyESX	N/A	N/A	6.29	N/A	N/A	
hypervisor -removeESX	N/A	N/A	6.29	N/A	N/A	
hypervisor -listESX	N/A	N/A	6.29	N/A	N/A	
hypervisor -bypassCert -set	N/A	N/A	6.30	N/A	N/A	
hypervisor -bypassCert -get	N/A	N/A	6.30	N/A	N/A	
autotiering -schedule -modify	N/A	N/A	6.30	N/A	N/A	
autotiering -schedule -enable|-disable	N/A	N/A	6.30	N/A	N/A	
autotiering -relocation -start	N/A	N/A	6.30	N/A	N/A	
autotiering -relocation -setrate	N/A	N/A	6.30	N/A	N/A	

Table 34. EMC® VNX® Navisphere CLI
(continued)

Command	CX series	CX3 series	CX4 series	AX4-5 Manager	AX4-5 Express	Comments
autotiering -relocation -pause|-resume	N/A	N/A	6.30	N/A	N/A	
autotiering -relocation -stop	N/A	N/A	6.30	N/A	N/A	
autotiering -info	N/A	N/A	6.30	N/A	N/A	
compression -on	N/A	N/A	6.30	N/A	N/A	
compression -pause	N/A	N/A	6.30	N/A	N/A	
compression -pauseall	N/A	N/A	6.30	N/A	N/A	
compression -resume	N/A	N/A	6.30	N/A	N/A	
compression -resumeall	N/A	N/A	6.30	N/A	N/A	
compression -modify	N/A	N/A	6.30	N/A	N/A	
compression -off	N/A	N/A	6.30	N/A	N/A	
compression -list	N/A	N/A	6.30	N/A	N/A	
cache -create	N/A	N/A	6.30	N/A	N/A	
cache -destroy	N/A	N/A	6.30	N/A	N/A	
cache -info	N/A	N/A	6.30	N/A	N/A	

Table 35. EMC® VNX® QoS Manager

Commands	CX series	CX3 series	CX4 series
nqm -getlatestperf	6.24	6.24	6.28
nqm -info	6.24	6.24	6.28
nqm -ioclass -create	6.24	6.24	6.28
nqm -ioclass -destroy	6.24	6.24	6.28
nqm -ioclass -list	6.24	6.24	6.28
nqm -ioclass -modify	6.24	6.24	6.28
nqm -measure	6.24	6.24	6.28
nqm -policy -create	6.24	6.24	6.28
nqm -policy -destroy	6.24	6.24	6.28
nqm -policy -list	6.24	6.24	6.28
nqm -policy -modify	6.24	6.24	6.28
nqm -schedule -create	6.24	6.24	6.28
nqm -schedule -destroy	6.24	6.24	6.28
nqm -schedule -list	6.24	6.24	6.28
nqm -schedule -modify	6.24	6.24	6.28
nqm -schedule -resume	6.24	6.24	6.28
nqm -schedule -suspend	6.24	6.24	6.28
nqm -setfallback	6.24	6.24	6.28
nqm -setoptions	6.24	6.24	6.28
nqm -stop	6.24	6.24	6.28
nqm -run	6.24	6.24	6.28
nqm -off	N/A	N/A	6.29
nqm -archive -dump	6.24	6.24	6.28
nqm -archive -retrieve	6.24	6.24	6.28

Table 36. EMC® VNX® Unisphere Analyzer

Commands	CX series	CX3 series	CX4 series
analyzer -set	6.24	6.24	6.28

Table 36. EMC® VNX® Unisphere Analyzer *(continued)*

Commands	CX series	CX3 series	CX4 series
analyzer -get	6.24	6.24	6.28
analyzer -logging	6.24	6.24	6.28
analyzer -start	6.24	6.24	6.28
analyzer -stop	6.24	6.24	6.28
analyzer -status	6.24	6.24	6.28
analyzer -archive	6.24	6.24	6.28
analyzer -archive-dump	6.26	6.26	6.28
analyzer -archiveretrieve	6.26	6.26	6.28
analyzer -archive-merge	6.26	6.26	6.28

Table 37. EMC® VNX® MirrorView/Asynchronous

Commands	CX series	CX3 series	CX4 series
mirror -async -addimage	6.19	6.22	6.28
mirror -async -change	6.19	6.22	6.28
mirror -async -changeimage	6.19	6.22	6.28
mirror -async -create	6.19	6.22	6.28
mirror -async -destroy	6.19	6.22	6.28
mirror -async -fractureimage	6.19	6.22	6.28
mirror -async -info	6.19	6.22	6.28
mirror -async -list	6.19	6.22	6.28
mirror -async -promoteimage	6.19	6.22	6.28
mirror -async -removeimage	6.19	6.22	6.28
mirror -async -setfeature	6.19	6.22	6.28
mirror -async -syncimage	6.19	6.22	6.28
mirror -disablepath	6.19	6.22	6.28
mirror -enablepath	6.19	6.22	6.28

Table 37. EMC® VNX® MirrorView/Asynchronous *(continued)*

Commands	CX series	CX3 series	CX4 series
`mirror -async -creategroup`	6.19	6.22	6.28
`mirror -async -destroygroup`	6.19	6.22	6.28
`mirror -async -addtogroup`	6.19	6.22	6.28
`mirror -async -removefromgroup`	6.19	6.22	6.28
`mirror -async -changegroup`	6.19	6.22	6.28
`mirror -async -syncgroup`	6.19	6.22	6.28
`mirror -async -fracturegroup`	6.19	6.22	6.28
`mirror -async -promotegroup`	6.19	6.22	6.28
`mirror -async -listgroups`	6.19	6.22	6.28

Table 38. EMC® VNX® MirrorView/Synchronous

Commands	CX series	CX3 series	CX4 series
`mirror -sync -addimage`	6.19	6.22	6.28
`mirror -sync -allocatelog`	6.19	6.22	6.28
`mirror -sync -change`	6.19	6.22	6.28
`mirror -sync -changeimage`	6.19	6.22	6.28
`mirror -sync -create`	6.19	6.22	6.28
`mirror -sync -deallocatelog`	6.19	6.22	6.28
`mirror -sync -destroy`	6.19	6.22	6.28
`mirror -sync -fractureimage`	6.19	6.22	6.28
`mirror -sync -info`	6.19	6.22	6.28
`mirror -sync -list`	6.19	6.22	6.28
`mirror -sync -listsyncprogress`	6.19	6.22	6.28
`mirror -sync -listlog`	6.19	6.22	6.28
`mirror -sync -promoteimage`	6.19	6.22	6.28
`mirror -sync -removeimage`	6.19	6.22	6.28
`mirror -sync -setfeature`	6.19	6.22	6.28
`mirror -sync -syncimage`	6.19	6.22	6.28

Table 38. EMC® VNX® MirrorView/Synchronous *(continued)*

Commands	CX series	CX3 series	CX4 series
mirror -disablepath	6.19	6.22	6.28
mirror -enablepath	6.19	6.22	6.28
mirror -sync -creategroup	6.19	6.22	6.28
mirror -sync -destroygroup	6.19	6.22	6.28
mirror -sync -addtogroup	6.19	6.22	6.28
mirror -sync -removefromgroup	6.19	6.22	6.28
mirror -sync -changegroup	6.19	6.22	6.28
mirror -sync -syncgroup	6.19	6.22	6.28
mirror -sync -fracturegroup	6.19	6.22	6.28
mirror -sync -promotegroup	6.19	6.22	6.28
mirror -sync -listgroups	6.19	6.22	6.28

Table 39. EMC® VNX® SAN Copy

Commands	CX series	CX3 series	CX4 series
sancopy -create	6.19	6.22	6.28
sancopy -destinfo	6.19	6.22	6.28
sancopy -duplicate	6.19	6.22	6.28
sancopy -info	6.19	6.22	6.28
sancopy -mark	6.19	6.22	6.28
sancopy -modify	6.19	6.22	6.28
sancopy -pause	6.19	6.22	6.28
sancopy -remove	6.19	6.22	6.28
sancopy -resume	6.19	6.22	6.28
sancopy -settings	6.19	6.22	6.28
sancopy -start	6.19	6.22	6.28
sancopy -stop	6.19	6.22	6.28
sancopy -throttle	6.19	6.22	6.28
sancopy -transfer	6.19	6.22	6.28

Table 39. EMC® VNX® SAN Copy *(continued)*

Commands	CX series	CX3 series	CX4 series
sancopy -unmark	6.19	6.22	6.28
sancopy -updatecon-nection	6.19	6.22	6.28
sancopy -verify	6.19	6.22	6.28

Table 40. EMC® VNX® SnapView

Commands	CX series	CX3 series	CX4 series	AX4-5 Manager	AX4-5 Express
clone | snapview -addclone	6.19	6.22	6.28		
clone | snapview -allocatecpl	6.19	6.22	6.28		
clone | snapview -changeclone	6.19	6.22	6.28		
clone | snapview -changeclone-feature	6.19	6.22	6.28		
clone | snapview -changeclone-group	6.19	6.22	6.28		
clone | snapview -consistent-fracture-clones	6.19	6.22	6.28		
clone | snapview -createclone-group	6.19	6.22	6.28		

Table 40. EMC® VNX® SnapView *(continued)*

Commands	CX series	CX3 series	CX4 series	AX4-5 Manager	AX4-5 Express
clone | snapview -deallocatec-pl	6.19	6.22	6.28		
clone | snapview -destroy-clonegroup	6.19	6.22	6.28		
clone | snapview -fracture-clone	6.19	6.22	6.28		
clone | snapview -listclone	6.19	6.22	6.28		
clone | snapview -listclone-feature	6.19	6.22	6.28		
clone | snapview -listclone-group	6.19	6.22	6.28		
clone | snapview -removeclone	6.19	6.22	6.28		
clone | snapview -resetfrac-turelog	No	6.22	6.28		
clone | snapview -reversesync-clone	6.19	6.22	6.28		
clone | snapview -syncclone	6.19	6.22	6.28		

Table 40. EMC® VNX® SnapView *(continued)*

Commands	CX series	CX3 series	CX4 series	AX4-5 Manager	AX4-5 Express
admsnap clone_activate	6.14	6.22	6.28	6.23	6.23
admsnap clone_deactivate	6.14	6.22	6.28	6.23	6.23
admsnap flush	6.14	6.22	6.28	6.23	6.23
admsnap list	6.14	6.22	6.28	6.23	6.23
snapview -activatesnapshot	6.19	6.22	6.28		
snapview -chgrollback	6.19	6.22	6.28		
snapview -chgsnapshot	6.19	6.22	6.28		
snapview -createsnapshot	6.19	6.22	6.28		
snapview -deactivatesnapshot	6.19	6.22	6.28		
snapview -destroysnapshot	No	No	No		
snapview -listrollback	6.19	6.22	6.28		
snapview -listsessions	6.19	6.22	6.28		
snapview -listsnapshots	6.19	6.22	6.28		

Table 40. EMC® VNX® SnapView *(continued)*

Commands	CX series	CX3 series	CX4 series	AX4-5 Manager	AX4-5 Express
snapview -listsnapableluns	6.19	6.22	6.28		
snapview -lunpool	6.19	6.22	6.28		
snapview -preparesnapshot	No	No	No		
snapview -rmsnapshot	6.19	6.22	6.28		
snapview -startrollback	6.19	6.22	6.28		
snapview -startsession	6.19	6.22	6.28		
snapview -stopsession	6.19	6.22	6.28		
admsnap activate	6.14	6.22	6.28	6.23	6.23
admsnap deactivate	6.14	6.22	6.28	6.23	6.23
admsnap flush	6.14	6.22	6.28	6.23	6.23
admsnap list	6.14	6.22	6.28	6.23	6.23
admsnap start	6.14	6.22	6.28	6.23	6.23
admsnap stop	6.14	6.22	6.28	6.23	6.23