EMC ControlCenter Navisphere Command Line Interface (CLI)

Version 6.X

REFERENCE

For Basic and Access Logix Commands

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Preface

This manual describes the EMC ControlCenter™ Navisphere® Command Line Interface (CLI) commands.

You should read this manual if you are responsible for installing and/or configuring the Navisphere Agent or CLI on a host. This manual assumes that you are familiar with the operating system running on the servers you will manage.

Before you can configure a storage system, you must understand storage system's components and configurations.

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

How This Manual Is Organized

This manual contains five chapters, as follows.

Chapter 1	Introduces Navisphere and the CLI.
Chapter 2	Explains the basic CLI commands; that is, those that are not specifically designed to manage optional features.
Chapter 3	Explains the Storage Group CLI commands for managing using the optional Access Logix™ feature.
Appendix A	Lists the error codes you might receive from CLI commands.

CLI commands for the EMC MirrorView™ software are explained in the MirrorView CLI manual and CLI commands for EMC SnapView™ (for both snapshots and LUN clones) are explained in the SnapView admsnap and CLI manual.

Other Navisphere Documents

EMC ControlCenter Navisphere Manager Version 6.X Administrator's Guide (P/N 069001125)

EMC MirrorView Command Line Interface (CLI) Administrator's Guide (P/N 069001184)

EMC SnapView admsnap and Command Line Interface (CLI) Administrator's Guide (P/N 069001181)

Format Conventions

We use the following format conventions in this manual:

Convention	Meaning
This type	Indicates text (including punctuation) that you type verbatim, all commands, pathnames, and filenames, and directory names.
This type	Represents a variable; an item for which you substitute a valid value.
`This type` or This type	Represents a system response (such as a message or prompt), a file or program listing.
[ ]	Encloses optional entries. Do not type the brackets.
x →y	Represents a menu path. For example, Change Parameters →Change Storage System Parameters tells you to select the Change Parameters item from the menu that appears, and then select the Change Storage System Parameters item from the next menu that appears.
|	Separates alternative parameter values; for example *LUN-name* | *LUN-number* means you can use either the LUN-name or the LUN-number.
↵	Represents the Enter key. (On some keyboards this key is called Return or New Line.)

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Canada:	**(800) 543-4782 (543-4SVC)**
Worldwide:	**(508) 497-7901**

Follow the voice menu prompts to open a service call, then select CLARiiON Product Support.

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Your suggestions will help us continue to improve the accuracy, organization, and overall quality of the user publications. Please e-mail us at **techpub_comments@emc.com** to let us know your opinion or any errors concerning this manual.

1 About EMC ControlCenter Navisphere CLI

This chapter describes the EMC ControlCenter™ Navisphere® storage-system management configurations and architecture. Major topics are

EMC ControlCenter Navisphere CLI supports both shared and unshared storage systems. A shared storage system has the Access Logix™ option; an unshared storage system does not have it. Only certain storage systems support the Access Logix option.

Terminology

Term	Meaning
Agent	EMC Navisphere Agent that runs on a server; see also Host Agent.
ATF	EMC Navisphere Application Transparent Failover software.
C-series storage system	C1000, C1900, C2x00, or C3000 series storage system.
CX-Series or FC4700-Series storage system	CX-Series and FC4700-Series storage system only.
CDE	EMC CLARiiON® Driver Extensions failover software.
CLI	EMC Navisphere Command Line Interface.
domain	In the context of Navisphere 6.X, a group of storage systems and/or portal servers that you can manage from a single management application session. You can divide the storage systems into multiple domains as long as each storage system or portal is in only one domain.
Event Monitor	EMC Navisphere Event Monitor.
FC-Series storage system	FC4700-2, FC4700, FC4400/4500, FC5600/5700, FC5400/5500, FC5200/5300, or FC5000 storage system.
JBOD storage system	Storage system *without* storage processors (SPs); that is, one that contains only DAEs and *no* DPEs.
Host Agent	EMC Navisphere Agent that runs on a storage-system server.
managed Agent	Host Agent or SP Agent managed by EMC Navisphere management software.
managed storage system	Storage system managed by EMC Navisphere management software.
Manager	EMC Navisphere Manager.
non-RAID Group storage system	Storage system whose SPs are running Core or Base Software that does not have the RAID Group feature.
Pre-FC4700-series storage system	Class of storage system whose SPs do not have a network management connection: FC4500, FC5300, FC5500, and FC5700 storage systems..
Portal	A server or storage system through which you manage one or more storage systems using Navisphere 6.X. Generally the managed systems are legacy systems such as FC4500s and FC5300s.
Powerpath	EMC Powerpath failover software.

Term	Meaning
RAID Group storage system	Storage system whose storage processors (SPs) are running Core or Base Software that has the RAID Group feature.
shared storage system	Storage system with the EMC Access Logix™ option, which provides data access control (Storage Groups). A shared storage system is always a RAID Group storage system.
SP Agent	EMC Navisphere Agent that runs on the SPs in an CX-Series or FC4700-Series storage system.
Storage Management Server software	Software that runs in a storage system or portal server and lets a person manage it over a network.
unshared storage system	Storage system without the EMC Access Logix option.

About Navisphere Management Software

Navisphere storage-management software includes Navisphere Manager and the Navisphere CLI. You can use Manager and/or the CLI to configure the storage systems connected to the servers on the LAN.

The architecture of the Navisphere version 6.X Manager and CLI differ radically, as follows:

- Manager 6.X is a web-based product that communicates with software called the Storage Management Server software that runs in SPs and servers. The SPs and servers are grouped in entities called storage domains. To manage storage systems in a domain, you must have a user account in the domain and log in to a storage system within the domain.
- CLI 6.X is a host-based product that communicates with Agent software running on an SP or server. The CLI does not recognize domains or Storage Management Server software and you need not log in to a domain (only into a server) to manage storage systems using CLI commands.

The tradeoffs between Manager and the CLI are as follows

Manager	CLI
Uses a graphical user interface (GUI) with on-line, context-sensitive Help	Uses a command line interface with a single help file through which you find the topic you want
Is web-based, and sees storage systems according to their storage domains; requires a user account and login	Is host based and lets you issue commands to any connected Host Agent or SP
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 Manager, you can configure, control, and retrieve status from any managed storage system on the LAN. You can also use the CLI to automate disk-storage management functions by writing shell scripts or batch files.

Storage falls into two categories, shared and unshared. A shared storage system is one that uses Core or Base Software with the Access Logix option (usually with switches); an unshared storage system is one that uses Core or Base Software without Access Logix.

The following figure shows the CLI management structure for shared storage systems connected to servers with Fibre Channel switches. The CLI on each server can manage the stroage systems of any server whose Host Agent configuration file contains the user's username and hostname.

The Manager 6.X architecture is not the same as the CLI architecture shown in these figures.

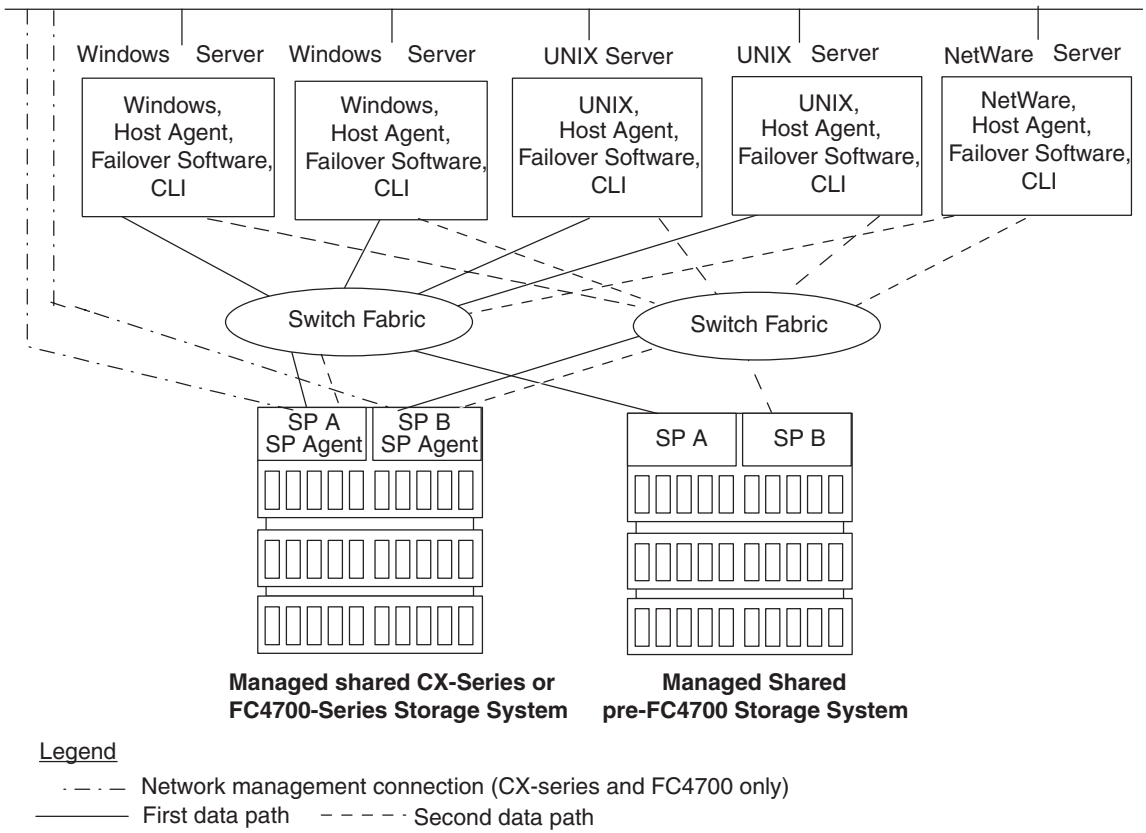


Figure 1-1 Sample CLI Storage Management Structure with Shared CX-Series or FC4700-Series Storage Systems

The following figure shows servers connected directly to their storage systems.

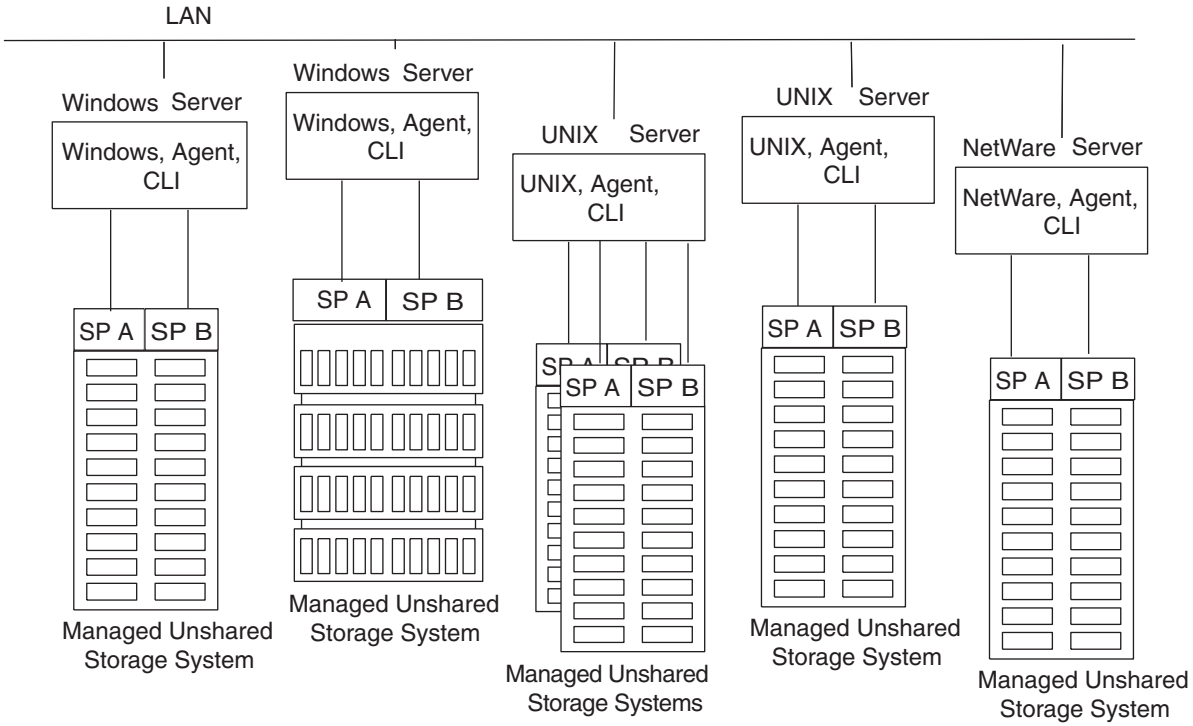


Figure 1-2 Sample Management Environment with Unshared Storage Systems

Storage-System Architecture with the CLI

The Navisphere CLI software communicates with the Agent running on servers on the network. TCP/IP must be loaded and configured on both host and client.

In a shared storage-system environment, the server CLI communicates with the server Host Agent, which communicates with server failover software (such as PowerPath™ or ATF), which in turn communicates with the storage-system SP Core or Base Software.

With CX-Series or FC4700-Series storage systems, management commands move over a separate network connection to perform management functions. There is a Host Agent on the server and an SP Agent in each SP.

Figure 1-3 shows the architecture for shared CX-Series or FC4700-Series storage system. Figure 1-4 shows the architecture for an FC4500 storage systems.

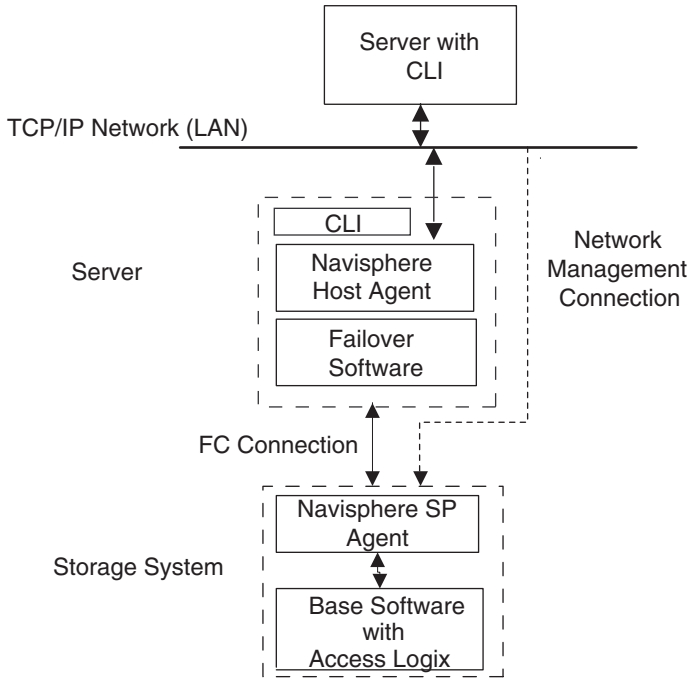


Figure 1-3 Architectural Components of a Shared Storage-System Environment with CX-Series or FC4700-Series Storage Systems Managed by the CLI

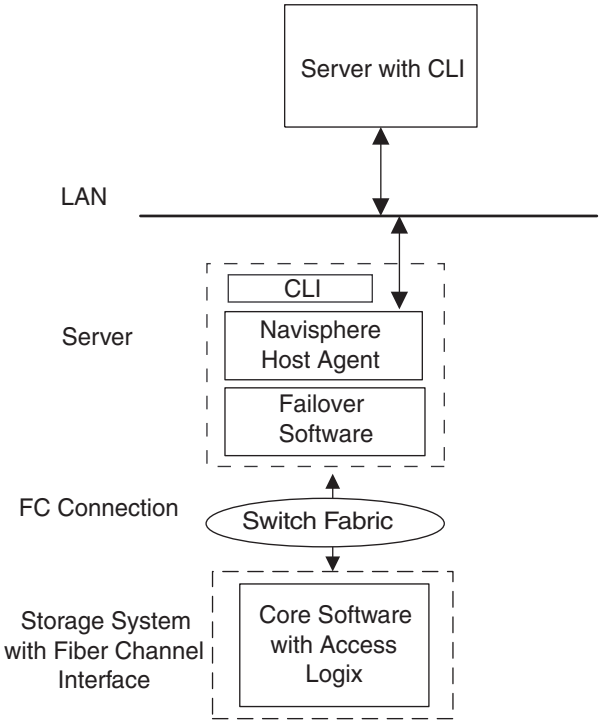


Figure 1-4 Architectural Components of a Shared Storage-System Environment with FC4500 Storage Systems Managed by the CLI

In an unshared storage-system environment, the server CLI communicates with the server Agent, which communicates with any server failover software, which in turn communicates with the storage-system SP Core Software. If failover software is not installed, the Agent communicates directly with Core Software.

Figure 1-5 shows the architecture for an unshared storage system.

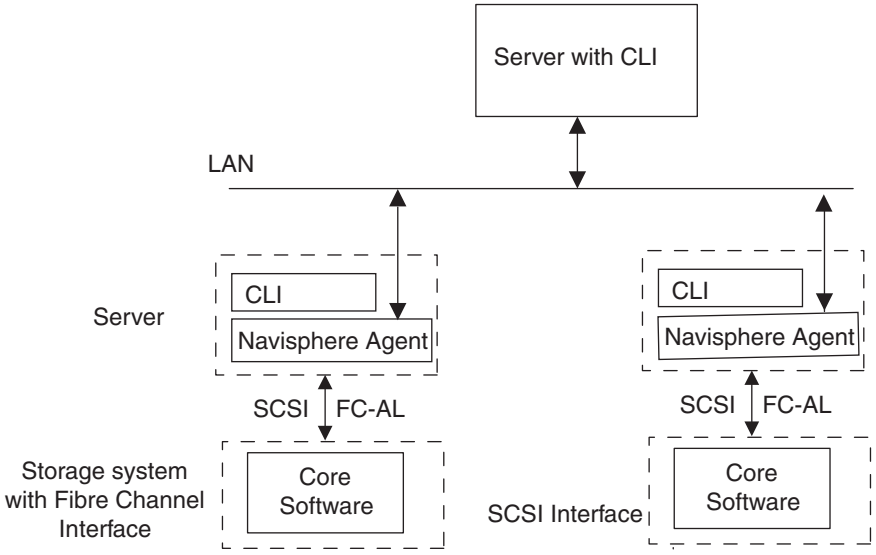


Figure 1-5 Architectural Components of an Unshared Storage-System Environment Managed by the CLI

What Next? Continue to the next section to learn how to configure storage systems using the CLI.

Storage-System Configuration and Management with the CLI

How you configure or manage storage systems with the CLI depends on whether the storage systems are shared or unshared.

While you are configuring or reconfiguring a pre-FC4700 storage system that is connected to multiple servers, you should manage the storage system using only one of the Host Agents. Managing the storage system using multiple Host Agents, in this situation, might result in a configuration command being sent through one Host Agent before a command sent through another Host Agent is completed. Such overlapping of commands may lead to performance degradation and even unpredictable results.

Shared Storage-System Configuration and Management

Before you can configure or manage shared storage systems with the CLI, you need to set up the Navisphere environment.

Until you enable data access control for a shared storage 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 storage system or that just *one* server has been powered up since the servers were connected to the storage system. You will use this server (called the configuration server) to configure the storage system.

To Set Up for Management

1. Install the CLI on the host you want to manage, as explained in the Agent/CLI installation guide.
2. (Optional) Install 6.X Navisphere Manager and Storage Management Server software on storage systems that you will manage. Manager 6.X has a different architecture from the CLI, as explained on page 1-4. For more convenience with certain operations, you should install Navisphere Manager.

To Install Optional Software on an CX-Series or FC4700-Series Storage System

Install SnapView™ and/or MirrorView™ software on the CX-Series or FC4700-Series storage system, as explained in the pertinent software manual.

To Set Up the Host or SP Agent

The Agent you set up depends on the storage-system type:

For an CX-Series or FC4700-Series storage system - Configure the SP Agent on each SP in the storage system, explained in the *Manager Administrator's Guide*.

For a pre-FC4700 storage system - Configure the Host Agent on the server (*Agent/CLI Installation Guide* or *Server Setup* manual).

To Configure a Storage System with the CLI

For an unshared storage overview, see the section *Storage Setup and Management Overview* on page 2-10.

For a shared storage overview, see the section *Shared Storage Setup and Management Overview* on page 3-2.

What Next? Continue to the chapter listed below for the type of commands you want:

Basic, unshared storage	Chapter 2
Storage Group, shared storage (Access Logix)	Chapter 3

2
Basic Commands

This chapter explains the EMC ControlCenter Navisphere CLI command **navicli** and each of its basic variations; that is, the CLI commands that are common to all midrange disk-array storage systems. Command variations for Storage Groups (Access Logix™ option) are explained in the following chapter.

CLI commands for the EMC MirrorView™ software are explained in the MirrorView CLI manual and CLI commands for EMC SnapView™ (for both snapshots and LUN clones) are explained in the *S*napView admsnap and CLI manual, P/N 069001181.

The basic CLI command variations are also documented in the **mancli.txt** file.

Major topics are

About CLI Commands

You run EMC Navisphere CLI from a command window. Each command consists of the **navicli** command (and switches) together with another subcommand (and its switches). The **navicli** command does nothing when executed by itself. However, when you use it in combination with the other commands described in this manual, you can configure and manage any storage system supported by Navisphere CLI version 6.X.

If a CLI command fails and the CLI does not generate its own error message, it displays an error message generated by the Host Agent or SP Agent. The CLI generates errors about command line syntax for commands and options and their values. CLI error codes appear in Appendix A.

Commands in this chapter support *both* RAID Group and non-RAID Group storage systems (unless the command description indicates exclusive use with one or the other). The number of possible LUN IDs differs. For RAID Group storage systems, the number is 1,024 (CX-Series) or 223 (other types of storage system). For non-RAID Group storage systems, the number is 32 (0-31). These ranges may have other restrictions depending on the operating system.

If you are familiar with the Navisphere CLI, particularly environment variables (or command line options) like **-h** (host) and **-d** (device), note that in CX-Series or FC4700-Series storage systems, the variable **-d** (device name) option is not required. This is true because in a CX-Series or FC4700-Series storage system, each SP is a host, addressable by hostname (**-h** switch), not a device (**-d** switch).

For consistency with previous CLI versions, the CLI accepts the **-d** switch for CX-Series or FC4700-Series storage systems, although it has no effect.

LUN IDs, Unique IDs, and Disk IDs

In Navisphere, the term *LUN ID* or *LUN number* means the unique integer assigned to the LUN when it is bound. When you bind 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 storage system and operating system. See the EMC Support Matrix on the Powerlink web site for the number of LUNs supported with your configuration.

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

Storage systems have 16-byte unique IDs; SPs, HBAs, LUNs, and switch ports have 32-byte unique IDs. In storage systems that use Storage Groups, the 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 storage system.

- For SCSI systems, the disk IDs are composed of a letter that indicates the internal bus number and the number of the disk on the bus. For example, the IDs of the disks on the first internal bus, bus A, are A0, A1, A2, A3, and A4.
- For all Fibre Channel storage systems except CX-Series or FC4700-Series, the disk IDs are composed of the enclosure number (the DPE is always 0) and the disk position, 0 (left) through 9 (right); that is,

  enclosure-number disk-number

  The IDs of the disks in CX-Series enclosure DAE2 0 are 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, and 14 and in enclosure DAE2 1 they are 015, 016, 017, 018, 019, 020, 021, 022, 023, 024, 025, 026, 027, 028, and 029. For an FC4700, the IDs in enclosure 0 (DPE) 0 are 0, 1, 2, 3, 4, 5, 6, 7, 8, and 9 and enclosure 1 (DAE) they are 10, 11, 12, 13, 14, 15, 16, 17, 18, and 19.
- CX-Series or FC4700-Series storage systems have two 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.

Disk IDs

The following sections show the Disk IDs of different storage system models: CX600 (limit 240 disks), CX400 (limit 60 disks), FC4700 (limit 120 disks), and pre-FC4700 (limit for rackmount version 100 disks).

CX600 and CX400 Disk IDs

The following figures show the disk IDs of CX600 and CX400 storage systems.

A CX600 storage system has an SPE (system processor enclosure that holds the SPs) and nine DAE2s (2-Gbit disk array enclosure).

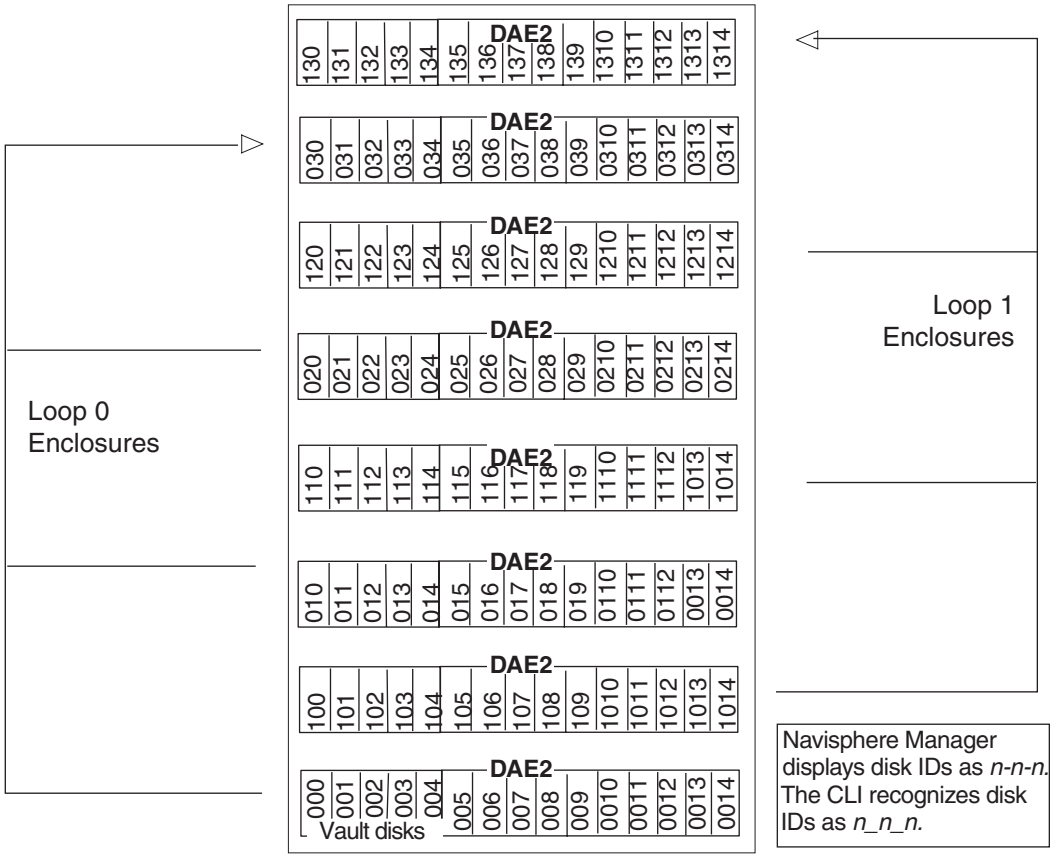


Figure 2-1 CX600 Disk IDs

The following figure shows the CX400 storage system, with a DPE2 (2-Gbit disk-array processor enclosure), with 15 disks and three DAE2s for a total of 60 disks.

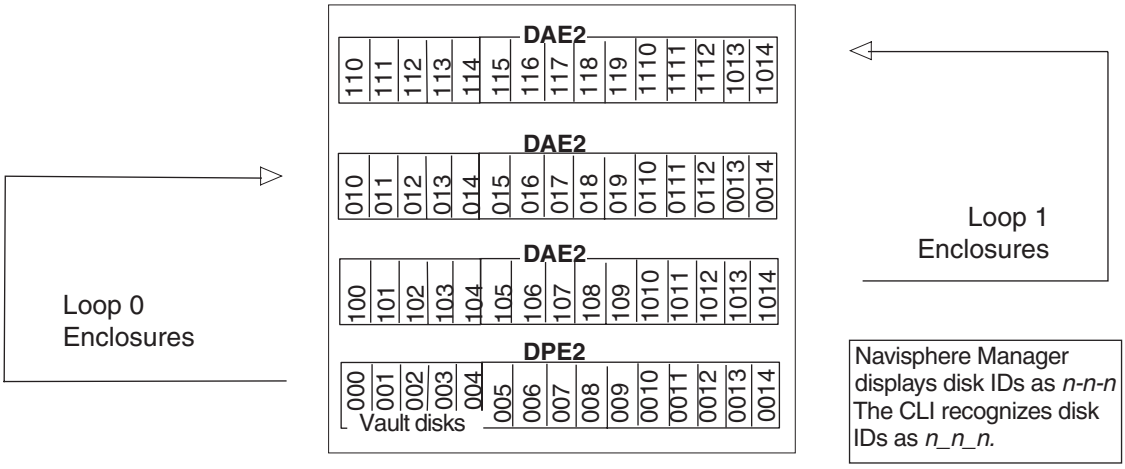


Figure 2-2 CX400 Disk IDs

FC4700-Series Disk IDs

The following figure shows the disk IDs of an FC4700-Series storage system that has one DPE (with the FC4700 SPs) and nine DAEs. The actual DAE enclosure numbers depend on the front-panel setting; those shown are typical. For cabling convenience, the enclosure numbers on each bus must ascend from the bottom of the cabinet toward the top. You can omit leading zeroes from disk IDs.

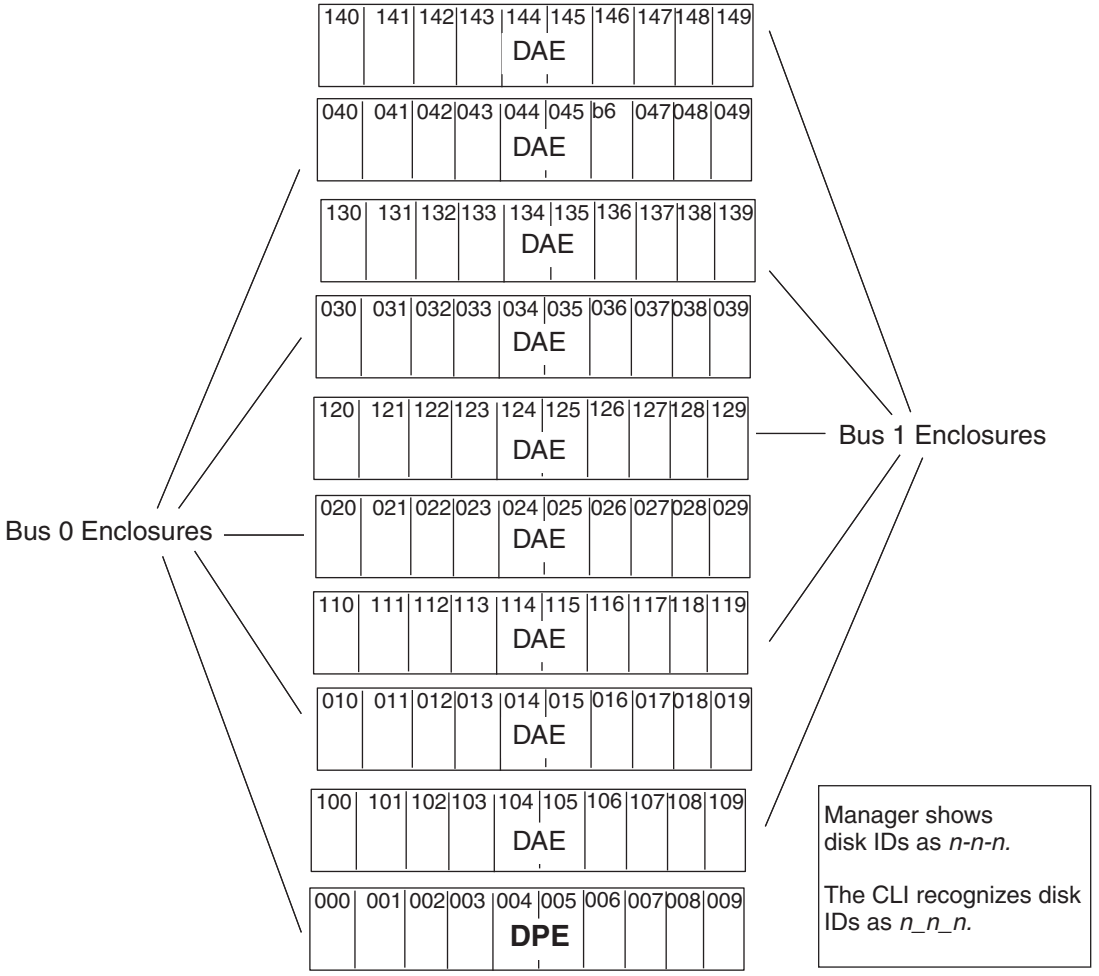


Figure 2-3 FC4700 Disk IDs

Pre-FC4700-Series Disk IDs

The following figure shows the disk IDs of a pre-FC4700 storage system that has one DPE (with the SPs) and two DAEs (deskside) or four DAEs (rackmount). The actual DAE enclosure numbers depend on the front-panel setting; those shown are typical. For cabling convenience, the enclosure numbers on each bus must ascend from the bottom of the cabinet toward the top. You can omit leading zeroes from disk IDs.

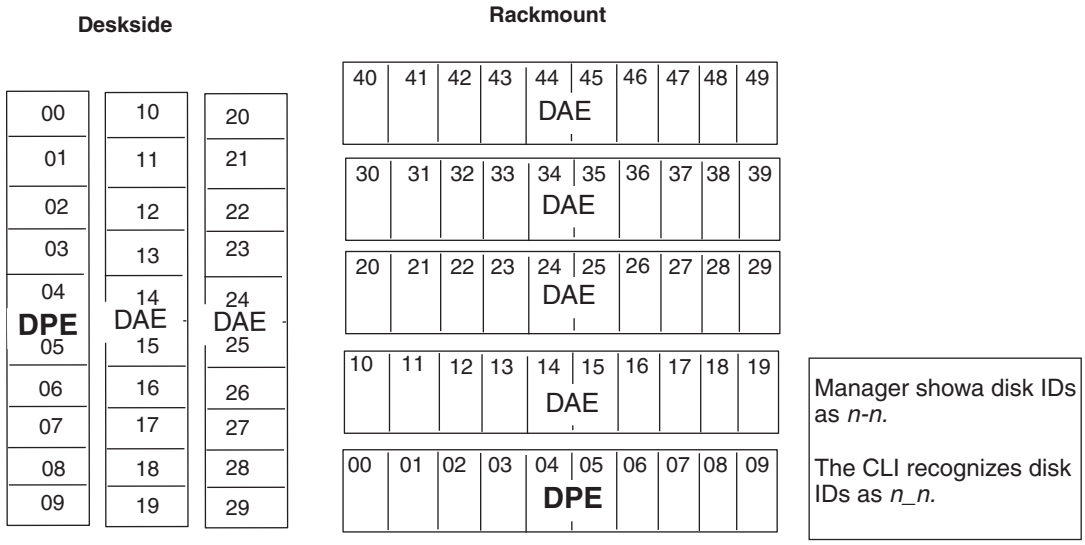


Figure 2-4 Pre-FC4700 Disk IDs

Storage Setup and Management Overview

This section shows how you might configure and monitor a storage system using CLI commands. It shows commands with UNIX® device names. The Windows device names would be drive letters. The storage system is a CX-Series or FC4700-Series-type system, in which each SP is a host. With unshared storage, the server connects directly (not through a switch) to the storage system. For an overview showing shared storage (switches), see Chapter 3.

1. Create four RAID Groups.

   navicli -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.

   navicli -h ss1_spa createrg 1 0_0_5 0_0_6 ↵

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

   navicli -h ss1_spa createrg 2 0_0_7 0_0_8 ↵

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

   navicli -h ss1_spa createrg 2 0_0_7 0_0_8 ↵

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

   navicli -h ss1_spa createrg 3 0_0_9 ↵

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

2. Bind a LUN on each RAID Group.

   navicli -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 s**witch. By default, read and write caching are enabled on the new LUN.

   navicli -h ss1_spa bind r1 1 -rg 1 ↵

   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.

navicli -h ss1_spa bind r1 2 -rg 2 ↵

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.

navicli -h ss1_spa bind hs -rg 3 ↵

Binds a hot spare on RAID Group 2. The hot space has not 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 storage system cache.

   navicli -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 storage system caching with 70% memory for write caching and 30% for read caching.

   navicli -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 Mbytes, enables write caching, sets a write cache page size of 8 Kbytes, sets a read cache size for each SP of 280 Mbytes, and enables read caching.

   For easy identification in the future, name the storage system.

   navicli -h ss1_spa arrayname users11 ↵

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

   This command changees the name of the storage system to **users11.**

At this point, you can create file systems on the LUNs from the operating system and store data on them. You can then learn the LUN device names using the **getagent** command and check status periodically using the **getsp**, **getdisk**, and/or **getlun** commands.

navicli

Sends status or configuration requests to the storage system via command line

Description

The **navicli** command sends storage system management and configuration requests to an API (application programming interface) on a local or remote server.

User Access

Anyone that can log in to the host running the Navisphere CLI.

Format

The **navicli** command is used as follows:

navicli -help
or
navicli [**-d** *device*] [**-h** *hostname*] [**-help**] [**-m**] {**-np**} [**-p**] [**-t** *timeout*] **-**[**v** | **q**] *CMD [optional-command-switches]*

where the **navicli** switches are

-help

Displays the help screen and does not start the **navicli** process.

-d *device* (required only for storage systems other than CX-Series or FC4700-Series)

Specifies the communication channel to the storage system, for pre-FC4700 SPs only. (An CX-Series or FC4700-Series SP is a host that you specify with the **-h** switch. The CLI ignores the **-d** switch for CX-Series or FC4700-Series.)

If you do not specify the **-d** switch, the environment variable **RaidAgentDevice** is the default value for the device. For any storage system that requires a communications channel, if **RaidAgentDevice** is not set and you omit the **-d** switch, the CLI will return an error message.

The **-d** switch overrides the **RaidAgentDevice** environment variable. You can get a list of RAID devices present using the **getagent** command with **navicli**. The *device* name is listed as the "Node" in the output from **getagent**.

The device name format of the listed devices varies as explained later in this section.

-h *hostname*

Specifies the hostname of the storage-system SP or server. For a CX-Series or FC-Series storage system, each SP is a host, therefore the hostname is the IP address or network name of the destination SP. For pre-FC4700 storage systems, the hostname is the server hostname or network address. The environment variable **RaidAgentHost** is the default for the server if the **-h** switch is not present. The **-h** switch overrides the **RaidAgentHost** setting. If **RaidAgentHost** is not set and the **-h** switch is not present, the local host name is used.

-m

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

-np

Suppresses polling on initial contact with the Agent. This switch significantly increases performance when dealing with large or multiple storage systems. The Agent automatically polls unless this switch is specified.

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

-p

Parses the entered *CMD* without making a network call to the API. If the string does not parse correctly, an error message prints to **stderr**; otherwise a message verifying that the string parsed correctly prints to **stdout**.

-q

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

-t *timeout*

Sets the timeout value. *timeout* specifies the value in seconds. The default timeout value is 240 seconds unless the **RaidAgentTimeout** environment variable (described on the following page) is set differently.The timeout value includes the

time allowed for the entire command to execute (including CLI, Agent, and storage-system software execution time). The timeout applies to all commands except **firmware**.

-v

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

CMD

One of a set of commands used with the **navicli** command to configure and manage a storage system.

CMD Switches

The *CMD* switches are described on the pages that follow.

Spaces in Arguments

Normally, each argument to a CLI command is composed of numbers, letters, and other valid printable characters for the operating system on which the CLI is running. For example

navicli -h server1 convertEMlog -pathname G:\logs\c4.log -20 ↵

If a filename or other argument (such as a Storage Group name) includes a space, you must enclose the entire string that includes the name in quotation marks (**"xx xx"**). For example, if the filename in the above were **c 4.log**, the valid command line would be

navicli -h server1 convertEMlog -pathname "G:\logs\c 4.log" -20 ↵

RaidAgent Environment Variables

The environment variables **RaidAgentHost**, **RaidAgentDevice**, and **RaidAgentTimeout** contain default values for the server, the device, and the timeout values respectively if you omit the **-h**, **-d**, and **-t** switches from the **navicli** command. See the **-h**, **-d**, and **-t** switch descriptions on pages 2-12 and 2-13. If you omit both **RaidAgentDevice** and the **-d** switch, the CLI will show an error on any command that needs device information. If you do not set **RaidAgentTimeout** is and omit the **-t** switch, the default timeout value is 25 seconds.

Examples The following examples show sample environment variable settings.

The commands in the following examples must be executed from the root directory.

set RaidAgentDevice \\.\A-9162244 ↵ (Windows device name)
set RaidAgentHost server1 ↵ (or for CX/FC4700, **ss1_spa** ↵)
set RaidAgentTimeout 45 ↵

Error Codes The **navicli** command might return any of a numeric sequence of errors explained in Appendix A.

Operating System Device Names and the CLI Communications Channel

When you issue management CLI commands to a storage system other than CX-Series or FC4700 series, you must include the **-d** switch (or rely on an environment variable) to specify the device by which the Agent will communicate with the storage system.

The device name format you use to specify the device varies with the operating system, as shown following.

For any operating system, for any storage system whose CLI commands require a communication channel, you can discover the device name of the communication channel using the **getagent** function, as follows:

navicli getagent -node -desc ↵

AIX Device Name Format

For Powerpath devices:

PwrP: hdisk*n*

where:
n is the number AIX assigns to the hdisk (LUN).

For ATF (Application Transparent Failover) or other non-Powerpath devices:

sp*n*

where:

n is the number that AIX® assigns to the pseudo-device, which represents the pair of SPs in the storage system. To find out

which number AIX assigns to pseudo-devices, use the command **lsdev -Ccarray**.

You can discover the communications channel device name using the **navicli getagent** command as shown earlier and on page 2-66. This applies to systems other than CX-Series and FC4700-Series only.

HP-UX® Device Name Format

For PowerPath devices:

PwrP: c*D***t***S***d***L***

For other devices:

c*D***t***S***d***L***

where for Fibre Channel disks:

D is the number of the fibre bus on the fibre adapter to which the storage system is connected.

S is the FC-AL address ID (decimal) of the storage system's SP that is connected to fibre bus **c***D*.

L is the ID of a LUN owned by the SP identified by **t***S*.

and for SCSI disks:

D is the number of the SCSI bus on the SCSI-2 adapter to which the storage system is connected. This number can range from 0 through 7.

S is the SCSI ID of the storage system's SP that connected to SCSI bus **c***D*. If the adapter identified by **c***D* provides a narrow SCSI bus, this SCSI ID can range from 0 through 7; and if the adapter provides a wide SCSI bus, this SCSI ID can range from 0 through 15.

L is the ID of a LUN owned by the SP identified by **t***S*.

You can discover the communications channel device name using the **navicli getagent** command as shown earlier and on page 2-66. This applies to systems other than CX-Series and FC4700-Series only.

IRIX Device Name Format

For a directly attached device (no switches):

sc*C***d***T***l***L***

where

C is the SP controller number IRIX® assigns (use **hinv -v** to identify).

T is the SCSI target ID of the SP, as determined by the AL-PA.

L is the LUN number.

For example, **sc1d2l3**

For a SAN (switched) device:

*W*_**lun***L*_**c***C***p***P***

where

W is part of the WWN Node Name of the storage system (use the CLI command **getarray** to identify).

L is the LUN number

C is the SP controller number IRIX assigns (use **hinv -v** to identify).

P is part of the WWN port name.

For example, **50:06:01:60:77:02:C7:A7_lun26_c1_p50:21:01_59:77:030**

You can discover the communications channel device name using the **navicli getagent** command as shown earlier and on page 2-66. This applies to systems other than CX-Series and FC4700-Series only.

Linux® Device Name Format

For PowerPath devices:

PwrP: sg*X*

For other devices:

sg*X*

where

X is the letter or number that specifies the **sg** device .

You can discover the communications channel device name using the **navicli getagent** command as shown earlier and on page 2-66. This applies to systems other than CX-Series and FC4700-Series only.

Novell NetWare Device Name Format

For Powerpath devices:

PwrP: V*m*-**A***d*-**D***i*:*l*

For ATF (Application Transparent Failover) devices:

V6F1-A*d*-**D***i*:*l*

For other devices:

V*m*-**A***d*-**D***i*:*l*

where

m is the manufacturer ID.

d is the load instance of the driver.

i is the target ID.

l is the LUN number.

Hyphens and colons are required. A sample NetWare® device name is **V596-A2-D0:2**.

You can discover the communications channel device name using the **navicli getagent** command as shown earlier and on page 2-66. This applies to systems other than CX-Series and FC4700-Series only.

Solaris Device Name Format

For PowerPath devices:

PwrP:c*D***t***S***d***L***s***P***

For ATF (Application Transparent Failover) devices:

clsp *X*

For non Powerpath and non-ATF devices:

c*D***t***S***d***L***s***P***

where for Fibre Channel disks:

D is the controller number the Solaris operating system assigns.

S is the FC-AL or target address ID (decimal) of the storage system's SP that is connected to fibre bus **c***D*.

L is the ID of a LUN owned by the SP identified by **t***S*.

P is the partition (slice) number.

X is the SP number assigned using the **clsp** software.

A sample Solaris device name is **PwrP:c1t0d0.**

and where for SCSI disks:

D is the controller number the Solaris operating system assigns.

S is the SCSI ID of the storage system's SP that is connected to **c***D*.

L is the ID of a LUN owned by the SP identified by **t***S*. This ID can range from 0 through 7.

P is the partition (slice) number.

You can discover the communications channel device name using the **navicli getagent** command as shown earlier and on page 2-66. This applies to systems other than CX-Series and FC4700-Series only.

Windows® Device Name Format

For PowerPath devices:

PwrP: SCSI2:0:1:0

For ATF (Application Transparent Failover) devices:

\\.\atf_sp0a

In a non-clustered environment without failover software:

SCSI2:0:1:0

In a clustered environment:

A-9162244

You can discover the communications channel device name using the **navicli getagent** command as shown earlier and on page 2-66. This applies to systems other than CX-Series and FC4700-Series only.

alpa -get (CX-Series/FC4700-Series only)

Displays the SCSI ID associated with an SP Port

alpa Command Background

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. The port IDs are 0, 1, 2, or 3 for CX-Series, 0 or 1 for FC4700-Series.

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

Description

The **navicli alpa** command **-get** function lists ALPA information for an CX-Series or FC4700-Series SP. 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. In an CX-Series or FC4700-Series system, each SP is a host, addressable by its hostname (**-h** switch).

User Access

You must have a user entry in the Navisphere Agent configuration file.

Format

alpa -get is used with the **navicli** (described on page 2-12) as follows:

alpa -get

Conventions and Recommendations

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

Example

navicli -h payroll_storage_spa alpa -get ↵

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

For SP A in an CX-Series or FC4700-Series storage system (SP hostname **payroll_storage_spa**), this command lists the SCSI ID associated with Port 0.

Output

See above. If the version of Base 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 (CX-Series/FC4700-Series only)

Updates the SCSI ID associated with an SP Port

Description

The **navicli alpa** command with the **-set** switch updates the SCSI ID value for the given port on an CX-Series or FC4700-Series 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 (0-255) or a duplicate ID on a storage 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**.

User Access

You must have a user entry in the Navisphere Agent configuration file.

Format

alpa -set is used with the **navicli** (described on page 2-12) as follows:

alpa -set -spa | -spb -portid *portid SCSI-ID* **[-o]**

where

-sp a | -spb

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 (CX-Series) or 0-1 (FC4700-Series). Valid port SCSI IDs range from 0 through 255.

-o

Overrides; does not prompt for confirmation.

Conventions and Recommendations

See the cautions above.

Example

navicli -h ss1_SPA alpa -set -spa -portid 1 1 ↵

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

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

Output

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

```
VALID_VALUES_0_255
VALID_VALUES_0_3
```

arraycommpath

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

Description

The **navicli arraycommpath** command creates or removes a communication path between the server and storage system. Generally this command is needed when you want to configure a storage system that has no LUNs bound. The setting should be 0 for ATF.

This command works for unshared storage systems (direct connection to host, without a switch) only. For a shared storage system (uses Access Logix, and connects via switch), use the command **storagegroup sethost -arraycompath**.

Changing the **arraycommpath** setting may force the storage system to reboot. The CLI will issue a confirmation request that indicates whether a storage-system reboot is required.However, 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 storage system inaccessible.

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

User Access

You must have a user entry in the Navisphere Agent configuration file.

Format

arraycommpath is used with **navicli** (described on page 2-12) as follows:

arraycommpath [0 | 1] [-o]

where

0

Disables a communication path. Use this mode with ATF.

1

Enables a communication path. Do not use this mode with ATF.

-o

Executes the command without prompting for confirmation.

Conventions and Recommendations

None.

Example

navicli -h server1 arraycommpath 1 ↵

```
WARNING: Previous setting will be discarded!

In order for this command to execute, write cache
must be disabled and memory size set to zero:
navicli -d devicename -h hostname setcache -wc 0.
This operation will cause a storage system reboot!
DO YOU WISH TO CONTINUE? (y/n) y ↵
```

For host **server1**, this command sets a communication path between server and storage system. In this example, the confirmation message shows that the change, if confirmed, will cause a storage system reboot.

Output

If the version of Core or Base 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
```

arrayname

Renames a storage system

Description

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

The CLI prompts for confirmation as follows.

User Access

You must have a user entry in the Navisphere Agent configuration file. For a storage system other than CX-Series or FC4700-Series, if configuration access control is enabled, you must issue the command from a trusted server (see *accesscontrol (FC4500 and FC5300)* on page 3-3).

Format

arrayname is used with **navicli** (described on page 2-12) as follows:

arrayname *NewArrayName*

where

NewArrayName Specifies the new name for the storage system.

Conventions and Recommendations

None

Examples

navicli -d c1t0d0s1 -h server1 arrayname users11 ↵

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

This command changes the name of the storage system whose device name is **c1t0d0s1** to **users11.**

Output

If the version of Core or Base Software running on the SP does not support this command, a `Not Supported` error message is printed to **stderr**.

baseuuid

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

Description

The **navicli 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 storage-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.

User Access

You must have a user entry in the Navisphere Agent configuration file. For a storage system other than CX-Series or FC4700-Series, if configuration access control is enabled, you must issue the command from a trusted server (see *accesscontrol (FC4500 and FC5300)* on page 3-3).

Format

baseuuid is used with **navicli** (described on page 2-12) as follows:

baseuuid [*uuid-base-value*]

where

uuid-base-value Specifies the UUID base. The UUID base must be in the range from 0 to 32767. new name for the storage system.

Conventions and Recommendations

None

Examples

navicli -h ss1_spa baseuuid ↵

```
Base UUID of the array: 12345
```

navicli -h ss1_spa baseuuid 34 ↵

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

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

Output

If the version of Core or Base Software running on the SP does not support this command, a `Not Supported` error message is printed to **stderr**.

bind (RAID Group)

Creates a LUN within an existing RAID Group

Description

The **bind** command, when executed on RAID Group storage systems, binds a LUN within an existing RAID Group. You can create a RAID group with the **createrg** command (page 2-57).

For a CX-Series or FC4700-Series storage system, each SP is a host (**-h** switch) to which you address the **bind** command. Ensure that you address the **bind** command to the SP that you want to own the LUN.

User Access

You must have a user entry in the Navisphere Agent configuration file. For a storage system other than a CX-Series or FC4700-Series, if configuration access control is enabled, you must issue the command from a trusted server (see *accesscontrol (FC4500 and FC5300)* on page 3-3).

Format

bind is used with **navicli** (described on page 2-12) as follows:

bind *raid-type* [*lun*] **-rg** *rgID*
[**-aa** *auto_assignment*] [**-cap** *capacity*] [**-elsz** *stripe-element-size*]
[**-n** *min_latency_reads*] [**-offset** *stripe-number*] [**-pl** *placement*]
[**-r** *rebuild-priority*] [**-rc** *read-cache*] [**-sp** **a**|**b**] [**-sq** *size-qualifier*]
[**-v** *verify-priority*] [**-wc** *write-cache*]

where

raid-type

Specifies the RAID type for the LUN.

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

lun

Specifies a decimal number to assign to the LUN (valid range is shown on page 2-5). 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 (page 2-57).

rgID specifies a number between 0 and the maximum number of RAID Groups supported by the RAID Group storage system.

The optional switches are

-aa *auto_assignment*

Enables or disables auto-assignment 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.)

-elsz *stripe-element-size*

Sets the stripe element size, which is the number of 512-byte disk blocks per physical disk within a LUN. The stripe size itself equals the stripe element size multiplied by the number of disks in the LUN. The stripe element size value can be any number greater than zero. The stripe element size can affect the performance of a RAID 5 or RAID 1/0 LUN. A RAID 3 LUN has a fixed stripe element size of one sector. *stripe-element-size* does not apply to a RAID 1 LUN, individual unit, or hot spare.

The smaller the stripe element size, the more efficient the distribution of data read or written. However, if the stripe element size is too small for a single I/O operation, the operation requires access to another stripe element, which causes the hardware to read and/or write from two disk modules instead of one. Generally, we recommend the smallest stripe element size be the smallest even multiple of 16 sectors that rarely forces access to another stripe element. The default stripe element size is 128 sectors.

To bind a RAID 3 LUN on storage system other than a CX-Series/FC4700-Series, use the **-elsz 1** switch to specify the element size. An element size of 1 is the only valid size for a

RAID 3 LUN with a non-FC4700 storage systems. Note that this element size is not valid for CX-Series/FC4700-Series storage systems.

-n *min_latency_reads* (FC 5400/5500 storage systems only)

Enables or disables minimal latency reads for RAID 3 only. *min_latency_reads* specifies functionality as follows:
0 = Disables minimal latency reads (default)
1 = Enables minimal latency reads

-offset *stripe-number*

Sets the LUN's starting Logical Block Address (LBA) to begin at *stripe-number* on the RAID Group. Depending on where the operating system writes its internal tables on the LUN, this may improve performance. 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*

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*

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.

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.

-rc *read-cache*

Enables or disables read cache functionality for this specific LUN. *read-cache* 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)
sc = stripe count
bc = block count

-v *verify-priority*

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.

-wc *write-cache*

Enables or disables the storage-system write cache for this specific LUN. *write-cache* values:
0 = Disables write cache
1 = Enables write cache (the default). Note that you cannot enable the write cache for a RAID 3 LUN.

Conventions and Recommendations

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

LUN Parameters for Different RAID Types

RAID Type	Bind Parameters
RAID 5, RAID 1/0	LUN number Rebuild time Stripe size Read and/or write caching
RAID 3	LUN number Rebuild time RAID 3
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:

First - RAID 1/0
Second - RAID 5, RAID 3, and RAID 0
Third - RAID 1
Fourth - Individual units and Hot Spares

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

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 5*	You must bind a *minimum* of three disk modules and *no more than* sixteen disk modules. We recommend you bind five modules for more efficient use of disk space.
RAID 3	You must bind *exactly* five or nine disk modules in a storage system with Fibre Channel disks.You cannot bind a RAID 3 LUN until you have allocated storage-system memory for the LUN. **IMPORTANT** RAID 3 does not allow caching, therefore, when binding RAID 3 LUNs, the **-c** *cache-flags* switch does not apply. When you check status on a RAID 3 LUN, caching always appears disabled.
RAID 1	You must bind *exactly* two disk modules.
RAID 0	You must bind a *minimum* of three disk modules, and *no more than* sixteen disk modules.
RAID 1/0	You must bind a *minimum* of four disk modules, and an even number of modules, but *no more than* sixteen modules. Navisphere Manager 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 any of the following disk modules as a hot spare on storage system with Fibre Channel disks For a write cache of 256 Mbytes or less: DPE disks 0 through 4 For a write cache larger than 256 Mbytes: DPE disks 0 through 8. 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 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 storage system integrates it into the LUN.

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 RAID 3 LUN or a hot spare. For caching to occur, storage-system caching must also be enabled (page 2-30 for RAID group storage systems). Whether you should use caching for a specific LUN depends on the RAID type. Recommendations for caching with different RAID types follow.

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	Not Allowed	Not Allowed
RAID 5	Highly recommended	Recommended
Disk	Acceptable	Recommended
Hot Spare	Not Allowed	Not Allowed

IMPORTANT LUNs cannot use write caching until you enable the storage-system write cache (page 2-175). LUNs cannot use read caching until you enable the read cache for the SP that owns the LUN (page 2-30 for RAID group storage 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.

When a LUN is assigned to an SP, its state becomes assigned, and the state of its disk modules become enabled when you use the SP that owns the LUN as the communications path to the chassis.

If you need to change the Description (RAID type) or Stripe Size parameters, you must unbind the LUN (page 2-194), 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 (page 2-44).

Examples

navicli -h ss1_spa createrg 0 0_0_1 0_0_2 0_0_3 0_0_4 0_0_5.↵

For a CX-Series or FC4700-Series, 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).

navicli -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 s**witch. By default, read and write caching are enabled on the new LUN.

Output

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

bind (non-RAID Group)

Groups one or more physical disks into a LUN of a RAID type

Description

The **bind** command groups physical disks into logical RAID levels when executed on non-RAID Group storage systems. For storage systems that use RAID Groups (most newer systems), see the **bind** command for RAID Groups.

User Access

You must have a user entry in the Navisphere Agent configuration file.

Format

bind is used with **navicli** (described on page 2-12) as follows:

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

where

raid-type

Specifies the RAID type for the LUN.

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

lun

Specifies a decimal number to assign to the LUN (valid range is 0-31). If not specified, the lowest available number (the default value) is assigned to the LUN.

disks

Specifies the physical disks to bind. The order in which you specify the disks has no significance except when binding a RAID type 1/0 (refer to page 2-40).

For a storage system with Fibre Channel disks:
disks has the format *e_d*, where:
e = enclosure number (in hex) and
d = disk number in the enclosure.

For example, 2_3 represents enclosure 2 disk 3.
Valid enclosure values are the hex numbers 0 through 9, A (the hex representation for 10), and B (the hex representation for 11). Valid disk numbers are 0 through 9.

For a storage system with SCSI disks:
disks has the format *bd*, where:
b = SCSI bus letter (A through E) and
d = disk number on the SCSI bus
For example, B3 represents SCSI bus B disk 3.

Valid SCSI bus letters and disk numbers are:

30-Slot Chassis

SCSI Bus	Disk Position	Disk ID
A	0, 1, 2, 3, 4, 5	A0, A1, A2, A3, A4, A5
B	0, 1, 2, 3, 4, 5	B0, B1, B2, B3, B4, B5
C	0, 1, 2, 3, 4, 5	C0, C1, C2, C3, C4, C5
D	0, 1, 2, 3, 4, 5	D0, D1, D2, D3, D4, D5
E	0, 1, 2, 3, 4, 5	E0, E1, E2, E3, E4, E5

20-Slot Chassis

SCSI Bus	Disk Position	Disk ID
A	0, 1, 2, 3	A0, A1, A2, A3
B	0, 1, 2, 3	B0, B1, B2, B3
C	0, 1, 2, 3	C0, C1, C2, C3
D	0, 1, 2, 3	D0, D1, D2, D3
E	0, 1, 2, 3	E0, E1, E2, E3

10-Slot Chassis

SCSI Bus	Disk Position	Disk ID
A	0, 1, 2, 3, 4	A0, A1, A2, A3, A4
B	0, 1, 2, 3, 4	B0, B1, B2, B3, B4

The optional switches are

-aa *auto_assignment*

Enables or disables auto-assignment functionality for the LUN. *auto_assignment* specifies functionality as follows:
0 = Disables auto-assignment
1 = Enables auto-assignment (the default)

-c *cache-type*

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, storage-system caching must also be enabled. Whether you should use caching for a specific LUN depends the RAID type. Recommendations for using caching for the different RAID types follow in *Conventions and Recommendations*.

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.

-elsz *stripe-element-size*

Sets the stripe element size, which is the number of 512-byte disk blocks per physical disk within a LUN. The stripe size itself equals the stripe element size multiplied by the number of disks in the LUN. The stripe element size value can be any number greater than zero. The stripe element size can affect the performance of a RAID 5 or RAID 1/0 LUN. A RAID 3 LUN has a fixed stripe element size of one sector. *stripe-element-size* does not apply to a RAID 1 LUN, individual units, or hot spares.

The smaller the stripe element size, the more efficient the distribution of data read or written. However, if the stripe element size is too small for a single I/O operation, the operation requires access to another stripe element, which causes the hardware to read and/or write from two disk modules instead of one. Generally, we recommend the smallest stripe element size be the smallest even multiple of 16 sectors that rarely forces access to another stripe element. The default stripe element size is 128 sectors.

To bind a RAID 3 LUN on a storage system other than a CX-Series/FC4700-Series, use the **-elsz 1** switch to specify the element size. An element size of 1 is the only valid size for a RAID 3 LUN with a non-FC4700 storage systems. Note that this element size is not valid for CX-Series/FC4700-Series storage systems.

-n *min_latency_reads* (FC 5400/5500 storage systems only).

Enables or disables minimal latency reads for RAID 3 FC5400/5500 only. *min_latency_reads* specifies functionality as follows:

0 = Disables minimal latency reads (default)
1 = Enables minimal latency reads

-r *rebuild-priority*

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.

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.

-sp a | b

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

-v *verify-priority*

Sets the priority at which each LUN's data 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 LUNs more slowly and has less impact on overall system performance. The default is ASAP.

-z *stripe-count*

Sets the number of stripes in a LUN. *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.

Conventions and Recommendations

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

LUN Parameters for Different RAID Types

RAID Type	Bind Parameters
RAID 5, RAID 1/0	LUN number Rebuild time Stripe size Read and/or write caching
RAID 3	LUN number Rebuild time RAID 3
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

Since each disk module in a storage system with SCSI disks is on only one of several internal buses, you should choose disk modules that provide balance across the internal buses.

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

First - RAID 1/0
Second - RAID 5, RAID 3, and RAID 0
Third - RAID 1
Fourth - Individual units and Hot Spares

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

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 5*	You must bind a *minimum* of three disk modules and *no more than* sixteen disk modules. We recommend you bind five modules for more efficient use of disk space. In a storage system with SCSI disks, you should use modules on different SCSI buses for highest availability.
RAID 3	You must bind *exactly* five or nine disk modules in a storage system with Fibre Channel disks and *exactly* five disk modules in a storage system with SCSI disks. In a storage system with SCSI disks, you should use modules on separate SCSI buses for highest availability. You cannot bind a RAID 3 LUN until you have allocated storage-system memory for the LUN. **IMPORTANT** RAID 3 does not allow caching; therefore, when binding RAID 3 LUNs, the **-c** *cache-flags* switch does not apply. When you check status on a RAID 3 LUN, caching always appears disabled.
RAID 1	You must bind *exactly* two disk modules.

LUN to Bind	Restrictions and Recommendations
RAID 0	You must bind a *minimum* of three disk modules, and *no more than* sixteen disk modules. If possible in a storage system with SCSI disks, use modules on different SCSI buses for highest availability.
RAID 1/0	You must bind a *minimum* of four disk modules, and an even number of modules, but *no more than* sixteen modules. Navisphere Manager 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. If possible in a storage system with SCSI disks, the modules you select for each pair should be on different SCSI buses for highest availability.
Individual disk unit	None
Hot Spare	You *cannot* bind the following disk modules as hot spares: For a storage system with Fibre Channel disks: 0:0 through 0:4 for a write cache 256 Mbytes or smaller; 0:0 through 0:8 for a write cache greater than 256 Mbytes For a storage system with SCSI disks: A0, B0, C0, D0, E0, A3, A4 for a 30-slot A0, B0, C0, D0, E0, A3 for a 20-slot A0, A1, A2, A3, A4, B0 for a 10-slot A0, B0, C0, D0, E0, A1 for a 10-slot TeleStor 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 bind one less module per LUN than you will eventually use by selecting an *empty slot* icon. However, the LUN will operate in a degraded mode until a module is installed in the empty slot and the storage system integrates it into the LUN.

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 RAID 3 LUN or a hot spare. For caching to occur, storage-system

caching must also be enabled (page 2-37). Whether you should use caching for a specific LUN depends on the RAID type. Recommendations for caching for the different RAID types follow.

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	Not Allowed	Not Allowed
RAID 5	Highly recommended	Recommended
Disk	Acceptable	Recommended
Hot Spare	Not Allowed	Not Allowed

IMPORTANT LUNs cannot use write caching until you enable the storage-system write cache (page 2-175). LUNs cannot use read caching until you enable the read cache for the SP that owns the LUN.

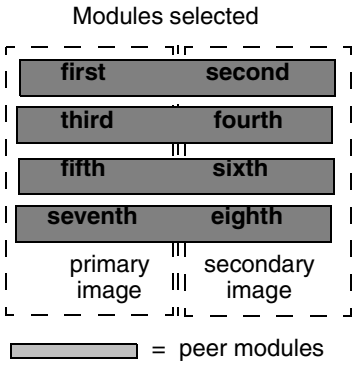
When binding RAID 1/0 LUNs, the order in which you select modules is important. The first module you select is the first part of the mirror's primary image and the second module is the first part of the mirror's secondary image; the third module is the second part of the primary image, the fourth module 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.

For high availability in a storage system with SCSI disks, the modules in a pair must be on different buses. For highest availability and performance in a RAID 1/0 LUN in a 30-slot or 20-slot storage system with SCSI disks, select disks on consecutive SCSI buses. For example, for a six-disk LUN, select the following disks in the order listed: A0, B0, C0, D0, E0, and A1. Modules A0 and B0 are peers, C0 and D0 are peers, and E0 and A1 are peers.

For highest availability and performance in a RAID 1/0 LUN in a 10-slot storage system with SCSI disks, select one disk on one bus, the second disk on the other bus, the third disk on the same bus as the

first disk, the fourth disk on the same bus as the second disk, and so on. For example, for a six-disk LUN, select the following modules in the order listed: A0, B0, A1, B1, A2, and B2. Modules A0 and B0 are peers, A1 and B1 are peers, and A2 and B2 are peers.

How modules you select for a RAID 1/0 LUN make up mirror images



When a LUN is assigned to an SP, its state becomes assigned, and the state of its disk modules become enabled when you use the SP that owns the LUN as the communications path to the chassis.

If you need to change the Description (RAID type) or Stripe Size parameters, you must unbind the LUN (page 2-194), 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 (page 2-44).

Examples

navicli -d c1t0d0s1 -h server1 bind
r5 3 1_0 1_1 1_2 1_3 1_4 -r high -c write ↵

Bind a RAID 5 LUN as LUN 3, from disks 1, 2, 3, 4, and 5,in DAE enclosure 1, with a rebuild priority of high and write caching enabled.

Output

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

chglun

Changes parameters on a currently bound LUN

Description

The **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*.

User Access

You must have a user entry in the Navisphere Agent configuration file. For a storage system other than CX-Series or FC4700-Series, if configuration access control is enabled, you must issue the command from a trusted server (see *accesscontrol (FC4500 and FC5300)* on page 3-3).

Format

chglun is used with **navicli** (described on page 2-12) as follows:

chglun -l *lun*
[**-a** *auto-assign*] [**-c** *cache-type*] [**-d** *default-owner*] [**-dp**] [**-i** *idle-thresh*]
[**-mp** *max-prefetch-blocks*] [**-n** *min-latency-reads*] [**-name** *newname*]
[**-pc** *max-prefetch-IO*] [**-pd** *min-prefetch-size*] [**-pf** *prefetch-type*]
[**-pm** *pf-size/mult*] [**-r** *rebuild-priority*] [**-rt** *retain-prefetch-data*]
[**-sm** *prefetch-segmnt-size/mult*] [**-t** *idle-delay-time*]
[**-v** *verify-priority*] [**-w** *write-aside*]

where

-l *lun*

Specifies which LUN to change. *lun* specifies the LUN number (0-1023 for CX-Series storage systems, 0-222 for Fibre Channel storage systems other than CX-Series; or 0-31 for SCSI storage systems). This switch is required.

The optional switches are

-**a** *auto-assign*

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 auto-assignment for specified LUN
1 = Enables auto-assignment for specified LUN

-c *cache-type*

Enables either read or write caching, both read and write caching, or neither type of caching for the LUN. For caching to occur, storage-system caching must also be enabled. Whether or not you

should use caching for a specific LUN depends on the RAID type. See the caching recommendations for different RAID types on page 2-42 (non-RAID group) or 2-33 (RAID group).

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

Sets the default prefetch values.

-i *idle-thresh*

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*

Sets the maximum number of disk blocks to prefetch in response to a read request. *max-blocks* specifies the maximum number. Valid entries are 0 through 2048; or, for CX-Series systems, 0 through 8192.

-n *min-latency-reads* (FC5400/5500 storage systems only)

Enables or disables minimal latency reads for RAID 3 on FC5400/FC500 only. *min_latency_reads* are as follows:
0 = Disables minimal latency reads functionality
1 = Enables minimal latency reads functionality

-name *newname*

Sets the LUN name. *newname* specifies the new name for the LUN. This switch applies only to storage systems running a version of Core or Base Software that supports Storage Group

commands. The LUN name is displayed in the GUI 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.

The **-name** switch applies only to shared storage systems.

-pc *max-prefetch-IO*

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

-pd *min-prefetch-size*

Sets the prefetch disable size. *min-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-size*. Valid values are 0 through 65534.

-pf *prefetch-type*

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*

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 *prefetch-type* (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 *prefetch-type* 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*

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 types LUNs 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.

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*

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-segment-size/mult*

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

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

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

-t *idle-delay-time*

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*

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*

Sets the smallest write request size in blocks that will bypass the write cache and go directly to the disks. *write-aside* specifies, in blocks, the largest write request size. Write requests less than or equal to the *write-aside* value are written directly to disk, bypassing write cache. Valid values are 16 through 65534.

Conventions and Recommendations

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	Not Allowed	Not Allowed (Acceptable on CX-Series or FC4700-Series)
RAID 5	Highly recommended	Recommended
Disk	Acceptable	Recommended
Hot Spare	Not Allowed	Not Allowed

IMPORTANT LUNs cannot use write caching until you enable the write cache (page 2-175). 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.

Examples

navicli -d c1t0d0s1 -h server1 chglun -l 3 -c write -r high ↵

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

Output

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

chgrg (RAID Group)

Changes properties of a RAID Group

Description

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

User Access

You must have a user entry in the Navisphere Agent configuration file. For a storage system other than CX-Series or FC4700-Series, if configuration access control is enabled, you must issue the command from a trusted server (see *accesscontrol (FC4500 and FC5300)* on page 3-3).

Format

chgrg is used with **navicli** (described on page 2-12) as follows:

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

where

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 storage system.

The optional switches are

-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 except for SCSI disks when binding a RAID 1/0 LUN (refer to page 2-40).

For a storage system with Fibre Channel disks, *disks* has the format *b_e_d*, where:

b= bus or loop number (0 or 1); mandatory on CX-Series systems; mandatory only for bus 1 on an FC4700-Series storage system (you can omit otherwise on FC4700).
e = enclosure number (in hex, always 0 for DPE) and
d = disk number in the enclosure.

For example, 2_3 represents bus 0, enclosure 2, disk 3. Valid enclosure values are hex numbers 0 through 9, A (hex representation for 10), and B (hex representation for 11). Valid disk numbers are 0 through 9. You can omit leading 0s. For details, see *LUN IDs, Unique IDs, and Disk IDs*, page 2-5.

For a storage system with SCSI disks:
disks has the format *bd*, where:
b = SCSI bus letter (A through E) and
d = disk number on the SCSI bus
For example, B3 represents SCSI bus B disk 3.

Valid SCSI bus letters and disk numbers are:

30-Slot Chassis

SCSI Bus	Disk Position	Disk ID
A	0, 1, 2, 3, 4, 5	A0, A1, A2, A3, A4, A5
B	0, 1, 2, 3, 4, 5	B0, B1, B2, B3, B4, B5
C	0, 1, 2, 3, 4, 5	C0, C1, C2, C3, C4, C5
D	0, 1, 2, 3, 4, 5	D0, D1, D2, D3, D4, D5
E	0, 1, 2, 3, 4, 5	E0, E1, E2, E3, E4, E5

20-Slot Chassis

SCSI Bus	Disk Position	Disk ID
A	0, 1, 2, 3	A0, A1, A2, A3
B	0, 1, 2, 3	B0, B1, B2, B3
C	0, 1, 2, 3	C0, C1, C2, C3
D	0, 1, 2, 3	D0, D1, D2, D3
E	0, 1, 2, 3	E0, E1, E2, E3

10-Slot Chassis

SCSI Bus	Disk Position	Disk ID
A	0, 1, 2, 3, 4	A0, A1, A2, A3, A4
B	0, 1, 2, 3, 4	B0, B1, B2, B3, B4

-lex *expansion*

Available only when the **-expand** *disks* switch is used. *expansion* specifies functionality as follows:
yes = Enables LUN expansion for the specified RAID Group
no = Disables LUN expansion for the specified RAID Group

-pri *priority*

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

Enables or disables the removal of the specified RAID Group after the last LUN in it has been unbound (**unbind** command). *remove* specifies the functionality as follows:
yes = Removes the RAID Group
no = Does not remove the RAID Group (the default)

-trespass *sp*

Trespasses all LUNs in the RAID Group to the specified storage processor. *sp* specifies the SP as follows:
a = SP A
b = SP B

Conventions and Recommendations

None

Examples

navicli -d c1t0d0s2 -h server1 chgrg 2 -trespass a ↵

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

Output

None

clearlog

Clears the SP's error log

Description

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

For a CX-Series or FC4700-Series storage system, each SP is a host (**-h** switch) to which you address the command. The command clears only the log of the SP you specify with the **-h** switch in the command.

User Access

You must have a user entry in the Navisphere Agent configuration file. For a pre-FC4700 storage system, if configuration access control is enabled, you must issue the command from a trusted server (see *accesscontrol (FC4500 and FC5300)* on page 3-3).

Format

clearlog is used with **navicli** (described on page 2-12) as follows:

clearlog

Conventions and Recommendations

None

Examples

navicli -d c1t0d0s1 -h server1 clearlog ↵

```
unsolicited error log cleared
```

This command deletes the SP logs of the storage system whose device name is **c1t0d0s1.**

Output

Confirmation message.

clearstats

Resets the SP's statistics logging

Description

The **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.

For a CX-Series or FC4700-Series storage system, each SP is a host (**-h** switch) to which you address the command. The command affects only the log of the SP you specify with the **-h** switch in the command.

User Access

You must have a user entry in the Navisphere Agent configuration file. For a pre-FC4700 storage system, if configuration access control is enabled, you must issue the command from a trusted server (see *accesscontrol (FC4500 and FC5300)* on page 3-3).

Format

clearstats is used with **navicli** (described on page 2-12) as follows:

clearstats

Conventions and Recommendations

None

Examples

navicli -d c1t0d0s2 -h server1 clearstats↵

```
Statistics successfully cleared, statistics logging
disabled.
```

Output

Confirmation message.

convertEMlog

Reads a stored Event Monitor log file

Description

The **convertEMlog** command reads a stored Event Monitor file without requiring an Agent to be running. This is one of the few commands that does not require an active Agent. You need to specify only a pathname, not a host and/or device name.

IMPORTANT: Depending on the size of the log, the **convertEMlog** command may take several minutes to execute.

For a CX-Series or FC4700-Series storage system, each SP is a host (**-h** switch) to which you address the command. The command affects only the log of the SP you specify with the **-h** switch in the command.

If you want to read an active (not stored) SP or Event Monitor log, use the **getlog** command.

User Access

Anyone who can log in to the host running the Navisphere CLI.

Format

convertEMlog is used with **navicli** (described on page 2-12) as follows:

convertEMlog [**-header**] **-pathname** *logfilepathname* [*+n*] [*-n*] [**-write** *destfile-pathname*]

where

-pathname

Specifies the full pathname of the Event Monitor log file.

The optional switches are

+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 you do not specify a range of entries, the CLI displays the entire log, with the oldest entry first.

-header

Creates headers for each column of log file information. By default, headers are omitted, allowing you to use the output log data directly as input to another program.

-write *destfile-pathname*

Writes the output to the file you specify in *destfile-pathname.* The CLI creates the file if it does not exist. By default, the CLI writes output to the standard output file.

Conventions and Recommendations

None.

Examples

navicli -h server1 convertEMlog -pathname G:\logs\cpc4.log -20 ↵

The CLI displays the most recent 20 entries in the Event Monitor log file **cpc42144.log**.

Output

The specified log entries.

createrg (RAID Group)

Creates a RAID Group

Description

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

User Access

You must have a user entry in the Navisphere Agent configuration file. For a pre-FC4700 storage system, if configuration access control is enabled, you must issue the command from a trusted server (see *accesscontrol (FC4500 and FC5300)* on page 3-3).

Format

createrg is used with **navicli** (described on page 2-12) as follows:

createrg *rgID* *disks* [**-pri** *priority*] [**-rm yes | no**]

where

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 storage system.

disks

Specifies the physical disks included in this RAID Group. The order in which you specify the disks has no significance.

For a storage system with Fibre Channel disks, *disks* has the format *b_e_d*, where:

b = bus or loop number (0 or 1); mandatory on CX-Series systems; mandatory only for bus 1 on an FC4700-Series storage system (you can omit otherwise on FC4700).
e = enclosure number (in hex, always 0 for the DPE) and
d = disk number in the enclosure.

For example, 2_3 represents bus 0, enclosure 2, disk 3.
Valid enclosure values are hex numbers 0 through 9, A (hex representation for 10), and B (hex representation for 11). Valid disk numbers are 0 through 9. For details, see *LUN IDs, Unique IDs, and Disk IDs*, page 2-5.

The optional switches are

-pri *priority*

Sets the priority for expanding or defragmenting the specified RAID Group. *priority* specifies the process priority as follows:
high = high priority
medium = medium priority
low = low priority (the default)

-rm yes | no

Enables or disables the removal of the specified RAID Group after the last LUN in it has been unbound (**unbind** command). *remove* specifies the functionality as follows:
yes = Removes the RAID Group
no = Does not remove the RAID Group (the default)

Conventions and Recommendations

None

Examples

navicli -d c1t0d0s1 -h server1 createrg 4 0_1 0_2 0_3 0_4 0_5 -pri high ↵

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

Output

None

failback (pre-FC4700 storage systems only)

Returns control of the fibre loop

This command applies only to Fibre Channel storage systems.

Description

The **failback** command returns control of the fibre loop to the specified SP. It applies only to pre-FC4700 storage systems such as FC4500 and FC5300.

Use **getloop** to determine if a **failback** is necessary.

User Access

You must have a user entry in the Navisphere Agent configuration file. For a pre-FC4700 storage system, if configuration access control is enabled, you must issue the command from a trusted server (see *accesscontrol (FC4500 and FC5300)* on page 3-3).

Format

failback is used with **navicli** (described on page 2-12) as follows:

failback

Conventions and Recommendations

None

Examples

navicli -d c1t0d0s2 -h server1 failback↵

Output

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

failovermode

Changes the type of trespass as needed for failover software (non-Access Logix only)

Description

The **navicli failovermode** command enables or disables the type of trespass needed for failover software.Use this command with certain types of failover software if suggested in the failover software Release Notice or manual.

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 unshared storage systems (direct connection to host, without a switch) only. For a shared storage system (uses Access Logix, and connects via switch), use the command **storagegroup sethost -failovermode**.

Changing the failover mode setting forces the storage system to reboot. It will ask for confirmation first 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 storage system inaccessible.

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

User Access

You must have a user entry in the Navisphere Agent configuration file.

Format

failovermode is used with **navicli** (described on page 2-12) as follows:

failovermode [0 | 1 | 2] [-o]

where

0

Failover mode 0; disables auto trespass mode for failover.

1

Failover mode 1.

2

Failover mode 2; enables auto trespass mode for failover.

Conventions and Recommendations

Your failover software Release Notes and/or manual contain advice on how to using **failovermode**, if you need to use the command.

Example

navicli -h server1 failovermode 1 ↵

```
WARNING: Previous setting will be discarded!

In order for this command to execute, write cache
must be disabled and memory size set to zero:
navicli -d devicename -h hostname setcache -wc 0.

This operation will cause a storage system reboot!

DO YOU WISH TO CONTINUE? (y/n) y ↵
```

For host **server1**, this command enables failover mode 1.

Output

If the version of Core or Base 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 or 1
```

firmware

Updates the SP Core Software and/or disk firmware

Description

The **firmware** command updates the SP Core Software (firmware) and/or disk firmware.

To update a CX-Series or FC4700-Series SP's Base Software, use the **navicli ndu** command. To update CX-Series or FC4700-Series disk firmware, use the **firmware** command as described here.

IMPORTANT Downloaded firmware becomes effective only after the storage system reboots.

User Access

You must have a user entry in the Navisphere Agent configuration file, and if configuration access control is enabled, you must issue the command from a trusted server (see *accesscontrol (FC4500 and FC5300)* on page 3-3).

Format

firmware is used with **navicli** (described on page 2-12) as follows:

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

where

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.

The optional switches are

-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 storage system server, you can still download firmware if you specify this flag.

-d *disks*

Downloads disk vendor firmware to specified disks.

IMPORTANT Do the following before downloading disk firmware on a FC5400/5500 Series storage system: disable the read and write caches; pause all host-generated I/O requests to the storage system; if

RAID 3 memory is assigned, set it to 2 Mbytes. Also, if you set your RAID 3 memory to 0 Mbytes, all RAID 3 LUNs will go to Ready state. We do not recommend that you do this unless your storage-system management software (Navisphere) has access to the storage system through the serial port.

disks specifies the physical disks whose firmware will be updated. The order in which you specify the disks has no significance.

For a storage system with Fibre Channel disks:
disks has the format *b/l_e_d*, where:
b/l = bus or loop number (0 or 1); needed only for bus 1 on a CX-Series or FC4700-Series storage system; omit otherwise.
e = enclosure number (in hex, always 0 for the DPE) and
d = disk number in the enclosure.
For example, 2_3 represents bus 0, enclosure 2, disk 3.
Valid enclosure values are hex numbers 0 through 9, A (hex representation for 10), and B (hex representation for 11). Valid disk numbers are 0 through 14 (CX-Series) or 0-9 (other storage systems). For details, see *LUN IDs, Unique IDs, and Disk IDs*, page 2-5.

For a storage system with SCSI disks:
disks has the format *bd*, where:
b = SCSI bus letter (A through E) and
d = disk number on the SCSI bus
For example, B3 represents SCSI bus B disk 3.

Valid SCSI bus letters and disk numbers are:

30-Slot Chassis

SCSI Bus	Disk Position	Disk ID
A	0, 1, 2, 3, 4, 5	A0, A1, A2, A3, A4, A5
B	0, 1, 2, 3, 4, 5	B0, B1, B2, B3, B4, B5
C	0, 1, 2, 3, 4, 5	C0, C1, C2, C3, C4, C5
D	0, 1, 2, 3, 4, 5	D0, D1, D2, D3, D4, D5
E	0, 1, 2, 3, 4, 5	E0, E1, E2, E3, E4, E5

20-Slot Chassis

SCSI Bus	Disk Position	Disk ID
A	0, 1, 2, 3	A0, A1, A2, A3
B	0, 1, 2, 3	B0, B1, B2, B3
C	0, 1, 2, 3	C0, C1, C2, C3
D	0, 1, 2, 3	D0, D1, D2, D3
E	0, 1, 2, 3	E0, E1, E2, E3

10-Slot Chassis

SCSI Bus	Disk Position	Disk ID
A	0, 1, 2, 3, 4	A0, A1, A2, A3, A4
B	0, 1, 2, 3, 4	B0, B1, B2, B3, B4

-o

Specifies not to prompt for confirmation.

-r

Relevant for pre-FC4700 storage systems only. Instructs the storage system to perform a hard reboot after the firmware is downloaded. The default is no reboot. FC4700 and later storage systems will always reboot after a disk firmware download, regardless of whether the switch **-r** is specified.

-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.

Conventions and Recommendations

None

Examples

navicli -d c1t0d0s2 -h server1 firmware /tmp/mcode.rev -o.↵

Downloads **mcode.rev**, which is located in the **tmp** directory.

Output

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

flashleds

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

Description

The **flashleds** 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.

User Access

Anyone who can log in to the host running the Navisphere CLI.

Format

flashleds is used with **navicli** (described on page 2-12) as follows:

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

where

-e *enclosure-number*

Specifies the disk-array enclosure. In each storage 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 storage systems) or ascending from 0 (for other storage-system types.

-b *bus-number*

Specifies the bus-number. For CX-Series or FC4700-Series storage systems, this number is 0 or 1. For other storage systems that have multiple buses, it is 0, 1, 2, or 3. This switch is required for systems with multiple buses. For other storage-system types, the switch is illegal and produces an error.

on | off

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

Conventions and Recommendations

None

Examples

navicli -h ss1_sp1 flashleds -e 1 -b 0 on ↵

...

navicli -h ss1_sp1 flashleds -e 1 -b 0 off ↵

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

Output

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

getagent

Gets device names and configurations

Description

The **getagent** command returns the names of devices that the destination Navisphere Agent controls. The command also displays descriptions of each device with which the Navisphere 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.

For a CX-Series or FC4700-Series storage system, 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.

User Access

Anyone who can log in to the host running the Navisphere CLI.

Format

getagent is used with **navicli** (described on page 2-12) as follows:

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

The optional switches are

-cabinet

Returns a description of the cabinet type.

-desc

Returns an ASCII description of the device (taken from the Navisphere Agent configuration file).

-mem

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

-model

Returns the model number of the SP.

SP Model Number	SP Type
CX-Series, FC4500, FC4700, FC4700-2, FC5200, FC5300, FC5400, FC5500, FC5600, FC5700	SP in storage system with Fibre Channel disks
5603	SP in 30-slot storage system with Fibre Channel disks
7305	PowerPC SP in 20-slot storage system with SCSI disks
7340	SP in 10-slot TeleStor storage system
7341	SP in 10-slot storage system with SCSI disks
7350	SP in 30-slot storage system with SCSI disks and SCSI host interface
7355	SP in 30-slot storage system with SCSI disks and Fibre Channel host interface
7624	AMD SP in 20-slot storage system with SCSI disks

-name

Returns the name of the device (taken from the Navisphere Agent configuration file).

-node

Returns the device's location in the file system.

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

-peersig

Returns the signature of the peer SP.

-prom

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

-rev

Returns the microcode revision number of the Core or Base Software that the SP is running. Each SP in the storage system will be running the same revision of Core or Base Software. You can update an SP's Core or Base 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 storage-system installation and maintenance manual.

-serial

Returns the serial number of the storage system.

-sig

Returns the unique SP signature.

-type

Returns the model type (deskside or rackmount).

-ver

Returns the version of the agent that is running.

Conventions and Recommendations

None

Examples

On any UNIX or Windows storage-system server:

navicli getagent↵

On a remote management station:

navicli -h server1 getagent +↵

Sample output follows.

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.

Output from a remote management station

```
Agent Rev:       5.3.0 (1.1)
Name:            \\.\atf_sp0a
Desc:            \\.\atf_sp0a
Node:            A-F20010500278
Physical Node:      \\.\atf_sp0a
Signature:       344242
Peer Signature:  344234
Revision:        1.88.10
SCSI Id:         0
Model:           4700
Model Type:      Rackmount
Prom Rev:        5.94.00
SP Memory:       512
Serial No:       F20010500278
SP Identifier:   A
Cabinet:         DPE
```

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
```

getall

Gets comprehensive storage system information.

Description

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

- Agent and host information
- Storage system (array) information
- HBA or switch information
- SP information
- Cache information
- Disk information
- LUN information
- RAID Group information
- Storage Group information
- SnapView information
- MirrorView information

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**.

For a CX-Series or FC4700-Series storage system, 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 field appear as NA.

If the host you specify with **navicli -h** *host* is an SP Agent, you will see all information on SP agents. If that host is a Host Agent then you will see data on the Host Agent only. Some information is not displayed if the feature is not activated or not supported. For example, mirrorview items are displayed only if MirrorView software is installed and activated.

User Access

Anyone who can log in to the host running the Navisphere CLI.

Format **getall** is used with **navicli** (described on page 2-12) as follows:

getall [**-sphost**] [**-host**] [**-array**] [**-hba**] [**-sp**] [**-cache**] [**-disk**] [**-lun**] [**-rg**] [**-sg**] [**-snapview**] [**-mirrorview**]

-sphost (CX-Series or FC4700-Series only)

Displays only the SP hostname.

-host

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

-array

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

-hba

Displays only information about each switch, HBA and port etc. This is a composite of information displayed by the **alpa**, **port**, **register**, and **getloop** commands.

-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 only information about disks and enclosures in the storage system. This is the same information displayed by the **getdisk** command.

-lun

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

-rg

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

-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.

-mirrorviews

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

Output Formats

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:	MirrorView 01_89_25, Navisphere 5.3.0	Dependency information
Required packages:	Navisphere >5.2.0.0.0, Base <01_89_99, Base >01_80_00,	Required package revision information
Is installation completed:	YES	YES / NO
Is this System Software:	NO	YES / NO

Storage System Information (-array switch) (Same Information Is Returned by Commands getcru 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
Bus 0 Enclosure 0 Fan A State: Present                 Unit (CRU)
Bus 0 Enclosure 0 Fan B State: Present                 information
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:	
HBA UID: 01:02:03:04:05:06:07:08:09:0A:0B:0C:0D:0E:01:12	HBA 32- byte unique 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: 50:06:01:60:20:04:A0:CF:50:06:01:60:40:04:A0:CF	32- byte unique ID 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 (CX-Series or FC4700-Series only)
Speed Value: 1	Speed of 1 or 2 Gbits (CX-Series or FC4700-Series only)

(SP B and SP B port information appears here.)

SP Information --------------		
Storage Processor:	SP A	A or B
Storage Processor Network Name: Storage Processor IP Address: Storage Processor Subnet Mask: Storage Processor Gateway Address:	naviqa22176 10.15.22.176 255.255.255.0 10.15.22.1	Network information (CX-Series or FC4700-Series only)
System Fault LED:	OFF	Status of fault LED.
Statistics Logging:	ON	Serve for performance monitoring
System Date: Day of the week: System Time:	08/15/2001 Wednesday 08:37:	SP clock information
Max Requests: Average Requests: Prct Busy: Prct Idle: Hard errors: Read_requests: Write_requests: Total Reads: Total Writes: Blocks_read: Blocks_written: Sum_queue_lengths_by_arrivals: Arrivals_to_non_zero_queue: Hw_flush_on: Idle_flush_on: Lw_flush_off: Write_cache_flushes: Write_cache_blocks_flushed: Internal bus 1 busy ticks: Internal bus 1 idle ticks: Internal bus 2 busy ticks: Internal bus 2 idle ticks: Internal bus 3 busy ticks: Internal bus 3 idle ticks: Internal bus 4 busy ticks: Internal bus 4 idle ticks: Internal bus 5 busy ticks: Internal bus 5 idle ticks: Controller busy ticks: Controller idle ticks:	1 4294967295 0 0 0 0 0 0 0 0 0 0 0 0 31 0 0 0 4294967295 4294967295 0 0 0 0 0 0 0 0 20787 1617657	Performance information (recorded only if Statistics logging is on)
(SP B information appears here.)		

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
```

Disk Information (Same as Returned by getdisk) HBA Information

```
All Disks Information
---------------------

Bus 0 Enclosure 0 Disk 0
Vendor Id:             SEAGATE
Product Id:            ST336704 CLAR36
Product Revision:      3A90
Lun:                   0 1 2 3
Type:                 0: RAID5 1: RAID5 2: RAID5
   3: RAID5
Hot Spare:             0: NO 1: NO 2: NO 3: NO
Prct Rebuilt:         0: 100 1: 100 2: 100 3: 100
Prct Bound:           0: 100 1: 100 2: 100 3: 100
Private:               0: 577536 1: 577536 2:
   577536 3: 577536
State:                 Enabled
Serial Number:         3CD0K5D1
Sectors:               2097152 (1074)
Capacity:              37180
Bind Signature:        0xbd4d, 0, 0
Hard Read Errors:      0
Hard Write Errors:     0
Soft Read Errors:      0
Soft Write Errors:     0
Read Retries:          0
Write Retries:         0
Remapped Sectors:      0
Number of Reads:       28175
Number of Writes:      2747
Number of Luns:        4
Raid Group ID:         0
Clariion Part Number: DG118031735
Request Service Time: 0 ms
Read Requests:         28175
Write Requests:        2747
Kbytes Read:           3265949
Kbytes Written:        2777
Stripe Boundry Crossing: 0
Queue Max:         1
Queue Avg:         0
Prct Idle          0
Prct Busy          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.)

Performance information (recorded only if Statistics logging is on)

```
Write Histogram[0] 0
Write Histogram[1] 0
```
(Write Histogram 2 through 10 information 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 Group ID:              0
State:                      Bound

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
```

RAID type
Group ID
State

(Listing for additional LUNs appears here.)

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_luns	Valid states are Invalid, 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 storage system
Raw Capacity (Blocks): 343391320	Raw capacity in disk blocks.
Logical Capacity (Blocks): 274713056	Logical capacity in blocks.
Free Capacity (Blocks,non-contiguous): 266324448	Free (unbound and non-contiguous) capacity of RAID Group in blocks,.
Free contiguous group of unbound segments: 266324448	Displays free contiguous group of 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: 28:D0:64:D0:BF:90:D5:11:80:1D:08:00:1B:41:07:5B	32- byte unique 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: HLU Number ALU Number ---------- ---------- 0 11 1 12 2 4	Host LUN number (HLU) and actual LUN number (ALU).
Shareable: NO	YES or NO

SnapView Information from -snapviews Switch (Same as Returned by Commands snapview -listsnapableluns and -listsessions)

`Snapviews Information`	
`----------`	
`Name LUN n`	List of LUN numbers for every LUN that can be a source LUN
`Name of the SP:`	SP A or SP B
`Count of Logical Units added in the cache pool:`	Number
`Logical Unit Numbers:`	LUN numbers
`Count of active sessions using the cache pool`	Number
`Session Names using the cache pool:`	Session names
`Cache size in MB:`	Number
`Cache chunk size in disk blocks:`	Number
`Cache Used in GB:`	Number
`Cache % Used:`	Number
`Luns that can be snapped:`	
The following items display for every snapshot, active or inactive	
`SnapView logical unit name:`	LUN name
`SnapView logical unit ID:`	32-byte unique ID
`Target Logical Unit:`	LUN ID (same for source and snapshot)
`State:`	Current state; for example, Active
`Session Name:`	Session name assigned at session start

MirrorView Information (Same as Returned by Commands mirrorview -info and -list)

```
Can a mirror be created on this system:            YES
Logical Units that are mirrored in Primary Images: 2
   10
Logical Units that are mirrored in Secondary Images:
Logical Units that can be mirrored:                 0
   1 3 4 5 6 7 8 9 11 12
Is Write Intent Log Used:                          NO
Remote systems that can be enabled for
   mirroring:50:06:01:60:20:04:60:4D


Logical Units that are mirrored in Primary Images: 10

Logical Units that are mirrored in Secondary Images:

Logical Units that can be mirrored:    0 1 3 4 5 6 7 8

Is Write Intent Log Used:                          YES

Remote systems that can be enabled for mirroring:
              50:06:01:60:20:04:60:4D

Remote systems that are enabled for mirroring:
UID of the array                    Status
----------------                    ------

50:06:01:60:20:04:A0:D0           Enabled on both SPs
50:06:01:60:20:04:60:4D           Enabled on both SPs

Maximum number of possible Mirrors:   50

Luns Used in Write Intent Log:

MirrorView Name:                Remote Mirror 2

MirrorView Description:

MirrorView UID:
50:06:01:60:20:04:A0:CF:02:00:00:00:00:00:00:00

Logical Unit Numbers:               2

MirrorView State:                   Active

MirrorView Faulted:                 NO

Raid Group Used in Write Intent Log:
```

YES or NO

LUN numbers

LUN number

LUN numbers

YES or NO

UIDs of the storage systems

UIDs of storage systems enabled for mirroring

Number

Lun Number

Raid Group Number

UID of the array	16 byte unique ID number
Status	Enabled or Disabled
Each Mirror Information:	
MirrorView Name:	Name
MirrorView Description:	Description
MirrorView UID:	32- byte unique ID number.
Logical Unit Numbers:	Number
MirrorView State:	Active or Inactive
MirrorView Faulted:	YES or NO
MirrorView Transitioning:	YES or NO
Quiesce Threshold:	Number
Minimum number of images required:	Number
Image Size:	Number
Image Count:	Number
Write Intent Log Used:	YES or NO
Images:	
Image UID:	8 byte unique ID number.
Is Image Primary:	YES/NO
Logical Unit UID:	32-byte unique ID number.
Image Condition:	Primary Image, Admin Fracture, System Fracture, To BE Synced, Syncing, Normal, or Waiting on Admin.
Preferred SP:	SP A or SP B

`Image State:`	Out Of Sync, InSync, or Consistent/Syncing. Value is meaningful only for a secondary image.
`Synchronzing Progress:`	Percentage synchronized, or N/A if synchronized or for primary image.
`Recovery Policy:`	Automatic or Manual. Value is meaningful only for a secondary image.

Examples See above.

Output See above.

getarrayuid (CX-Series or FC4700-Series Only)

Gets the storage system unique ID

Description

The **getarrayuid** command displays the unique ID (UID) of the storage system that contains the current SP. The SP, HBA, and switch ports also have unique IDs

If you specify one or more SPs (*sphosts*), then the CLI displays the unique ID of the storage systems containing those SPs. Knowing the UID of an SP's storage system is useful with MirrorView mirroring commands and for other operations.

User Access

Anyone who can log in to the host running the Navisphere CLI.

Format

getarrayuid is used with **navicli** (described on page 2-12) as follows:

getarrayuid [*sphostnames*]

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.

Examples

navicli -h ss1_spa getarrayuid ↵

```
Host name    Array UID
Cps42199     50:06:01:60:77:02:C7:A7
```

Output

The UID of the storage system that holds the SP (see above).

getatf

Determines if ATF or CDE (driver extension software) is installed and running and if there are trespassed LUNs on the server

Description

If ATF or CDE is installed on the host, **getatf** returns the ATF or CDE and the version number. **getatf** also displays any current trespassed or failed over LUN information.

User Access

Anyone who can log in to the host running the Navisphere CLI.

Format

getatf is used with **navicli** (described on page 2-12) as follows:

getatf

Conventions and Recommendations

None

Examples

On any UNIX or Windows storage-system server:

navicli -d clt0d0s2 -h server1 getatf ↵

Output

ATF, CDE, or None. If ATF or CDE, the version number and the running state: Yes or No

In the following example, ATF version number 2.0.1.1 is installed and running. ATF has transferred ownership of LUN 1 on array A-95-00052-02510 from the default SP (SP B) to SP A.

```
Type:            ATF
Version:       2.0.1.1
Running:       YES
Trespassed LUNID: A-95-0052-0510 - LUN 1
Current SP:       SP A
Default SP:        SP B
```

getcache

Gets cache environment information

Description

The **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 storage system has the following components:

- Two SPs
- A fully charged Standby Power Supply (SPS)
- Disk modules in 0:0 through 0:8

Caching statistics are meaningful only if the SP's write cache is enabled.

User Access

Anyone who can log in to the host running the Navisphere CLI.

Format

getcache is used with **navicli** (described on page 2-12) as follows:

getcache [-asys] [-bsys] [-bbutd] [-bbutt] [-freebackend] [-freecontrol] [-freefrontend] [-high] [-low] [-mirror] [-page] [-pdp] [-pmbackend] [-pmcontrol] [pmfrontend] [-ppo [-rh] -rm3a] [-rm3b] [-rsta] [-rstb] [-rsza] [-rszb]-spa] [-spb] [-state] [-ucp] [-wsta][-wstb] [-wsza] [-wszb]

The optional switches are

-asys

Returns the size of SP A's memory buffer (system buffer space, excludes cache). (This replaces the function of the CLARVOiiANT® **systemmemory** command.)

-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.

-**freebackend** (FC5400/5400 series storage systems only)

Returns, in Mbytes, the size of free memory available in the SP's back-end memory bank.

-**freecontrol** (FC5400/5400 series storage systems only)

Returns, in Mbytes, the size of the free memory available in the SP's control memory bank.

-**freefrontend** (FC5400/5400 series storage systems only)

Returns, in Mbytes, the size of the free memory available in the SP's front-end memory bank.

-**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 Kbytes, of a cache page. This size can be 2, 4, 8, or 16 Kbytes. The default size is 2 Kbytes.

-**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.

-pmbackend (FC5400/5400 series storage systems only)

Returns, in Mbytes, the physical memory size for the SP's back-end memory bank.

-pmcontrol (FC5400/5400 series storage systems only)

Returns, in Mbytes, the physical memory size for the SP's control memory bank.

-pmfrontend (FC5400/5400 series storage systems only)

Returns, in Mbytes, the physical memory size for the SP's front-end memory bank.

-ppo

Returns the percentage of pages owned by the SP.

-rh

Returns the read hit ratio, the percentage of cache read hits for the SP. Not supported on CX-Series storage systems.

A read hit occurs when the SP finds a sought page in cache memory, and thus does not need to read the page from disk. The ratio is meaningful only if the SP's read cache is enabled. High hit ratios are desirable because each hit indicates at least one disk access that was not needed. You may want to compare the read and write hit ratios for the LUN with the read and write hit ratio for the entire storage system. For a LUN to have the best performance, the hit ratios should be higher than those for the storage system. A very low read or write hit rate for a busy LUN may mean that caching is not helping the LUN's performance.

-rm3a

Returns the amount of memory, in Mbytes, reserved for the optimized RAID 3 data buffers on SP A.

-rm3b

Returns the amount of memory, in Mbytes, 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 Mbytes, the amount of read cache memory SP A is allowed to use.

-rszb

Returns, in Mbytes, 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 storage-system caching. This number equals the cache size divided by the cache page size, minus space for checksum tables. If the storage 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 storage-system caching. This number equals the cache size divided by the cache page size, minus space for checksum tables. If the storage 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 Mbytes 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).

-wh

Returns the write hit ratio; that is, the percentage of cache write hits for the SP's write cache. Not supported on CX-Series storage systems.

A write hit occurs when the SP finds and modifies data in cache memory, which usually saves a write operation. For example, with a RAID 5 LUN, a write hit eliminates the need to read, modify, and write the data. High hit ratios are desirable because each hit indicates at least one disk access that was not needed. You may want to compare the read and write hit ratios for the LUN with the read and write hit ratio for the entire storage system. For a LUN to have the best performance, the hit ratios should be higher than those for the storage system. A very low read or write hit rate for a busy LUN may mean that caching is not helping the LUN's performance.

-wsta

Returns the current internal state of SP A's write cache.

-wstb

Returns the current internal state of SP B's write cache.

-wsza

Returns the write cache size for SP A (always equal to that of SP B).

-wszb

Returns the write cache size for SP B (always equal to that of SP A).

Conventions and Recommendations

None

Examples

navicli -d c1t0d0s1 -h server1 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
SP 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
SPA Write Cache State               Disabled
SPB 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
```

getconfig

Returns storage-system type configuration information

Description

Displays storage-system type configuration information. If you omit switches, it displays all configuration type information. You can set configuration information with **setconfig**. (The **getconfig** command replaces the CLARVOiiANT **systemconfig** command.)

User access

Anyone who can log in to the host running the Navisphere CLI.

Format

getconfig is used with **navicli** (described on page 2-12) as follows:

getconfig [**-ptype**] [**-que**] [**-rer**] [**-tn**] [**-pg8**] [**-rep**]

where

-ptype

Displays the storage-system package type.

-que

Displays the setting on how queue full status is handled. `Yes` means that the Core or Base 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.

Conventions and Recommendations

Use the **getsp** command to display SP revision and signature information.

Examples

navicli -d clt0d0s2 -h server1 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
```

Output

See above.

getcontrol

Gets SP performance information

Description

The **getcontrol** command returns information about the SP performance.

User Access

Anyone who can log in to the host running the Navisphere CLI.

Format

getcontrol is used with **navicli** (described on page 2-12) as follows:

getcontrol [**-allib**] [**-arv**] [**-avg**] [**-busy**] [**-cbt**] [**-date**] [**-day**] [**-flush**] [**-he**] [**-ib1**] [**-ib2**] [**-ib3**] [**-ib4**] [**-ib5**] [**-idle**] [**-max**] [**-read**] [**-rw**] [**-sc**] [**-sf**] [**-sl**] [**-time**] [**-write**]

The optional switches are

-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.

-avg

Returns the average number of requests seen by the SP. Not supported on CX-Series systems.

-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.

-he

Returns the number of hard errors the SP has seen. Not supported on CX-Series systems.

-ib1

Returns the Internal bus 1 idle and busy ticks. None of the switches **ib1** through **ib5** are supported on CX-Series systems.

-ib2

Returns the Internal bus 2 idle and busy ticks.

-ib3

Returns the Internal bus 3 idle and busy ticks.

-ib4

Returns the Internal bus 4 idle and busy ticks.

-ib5

Returns the Internal bus 5 idle and busy ticks.

-idle

Returns the percentage of time the SP is idle.

-max

Returns the maximum number of requests seen by the SP. Not supported on CX-Series systems.

-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.

Conventions and Recommendations

None

Examples

navicli -d c1t0d0s2 -h server1 getcontrol ↵

Output

The following is a sample output. Actual output varies depending upon which switches you use with the **getcontrol** command.

```
System Fault LED:                    OFF
Statistics Logging:                  ON
SP Read Cache State                  Enabled
SP Write Cache State                 Disabled
Max Requests:                        2
Average Requests:                    0
Hard errors:                         0
Total Reads:                         39899771
Total Writes:                        0
Prct Busy:                           0
Prct Idle:                           0
System Date:                         08/12/1998
Day of the week:                     Wednesday
System Time:                         14:01:35
Read_requests:                       39899771
Write_requests:                      0
```

```
Blocks_read:                              658341649
Blocks_written:                           0
Sum_queue_lengths_seen_by_arrivals:       20009537
Arrivals_to_non_zero_queue:               20009537
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:                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:                   136230
Controller idle ticks:                    16461120
```

getcrus

Gets CRU state information

Description

The **getcrus** command returns state information on all or selected CRUs (customer replaceable units) in the storage system except for disks (see the **getdisk** command). 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.)

User Access

Anyone who can log in to the host running the Navisphere CLI.

Format

getcrus is used with **navicli** (described on page 2-12) as follows:

getcrus [-bbu] [-cablingspsa] [-cablingspsb] [-fana] [-fanb] [-fanc] [-lcca] [-lccb] [-lccreva] [-lccrevb] [-lccsna] [-lccsnb] [-spa] [-spb] [-spsa] [-spsb] [-vsca] [-vscb] [-vscc]

The optional switches are

-bbu

Applies only to SCSI storage systems. Returns the state information for the BBU.

-cablingspsa

Returns the cabling status for SPS A (standby power supply A): `valid` or `invalid`.

-cablingspsb

Returns the cabling status for SPS B (standby power supply B): `valid` or `invalid`.

-fana

Returns the state information for fan A.

Each enclosure has one fan module, which is a CRU. The fan module has nine fans that comprise two banks: FAN BANK A, FAN BANK B. If any fan fails, a fault is displayed for its bank, and other fans speed up to compensate. They cool the storage system indefinitely; however, if failure occurs in the normally functioning bank, the temperature rises and the storage system shuts down after two minutes.

If a fan bank is down, you can determine whether it has failed by seeing if its button is amber, looking at the event log for fan failures, or seeing if the replace light on the fan module is lit. If a fan bank has failed, the system operator or service person should replace the fan module as soon as it is practical.

-fanb

Returns the state information for fan B. See **-fana** description (above).

-fanc (SCSI storage systems only)

Returns the state information for fan C. See **-fana** description above

-lcca (Fibre Channel storage systems only)

Returns the state information of the LCC for SP A.

-lccb (Fibre Channel storage systems only)

Returns the state information of the LCC for SP B.

-lccreva | -lccrevb (Fibre Channel storage systems only)

Returns the revision of the DPE LCC A, LCC B, or both if you specify both switches. (These switches replace a function of the CLARVOiiANT **lcc** command.)

-lccsna | -lccsnb (Fibre Channel storage systems only)

Returns the serial number of the DPE LCC A, LCC B, or both if you specify both switches. (These switches replace a function of of the CLARVOiiANT **lcc** command.)

-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.

-vsca

Returns the state information on SCSI power supply A.

Each chassis has up to two power supplies: VSC A and VSC B. If a chassis has two VSCs, it can continue operating if one VSC fails, but shuts down immediately if the second VSC fails. If a VSC is down, you can determine whether it has failed by seeing if its button is amber, looking at the event log for VSC failures, or seeing if the Replace light on the VSC is lit. If the VSC has failed, the system operator or service person should replace the VSC as soon as it is practical.

-vscb

Returns the state information for SCSI power supply B. See **-vsca** description (above).

-vscc

Applies only to SCSI storage systems. Returns the state information for SCSI power supply C. See **-vsca** description (above).

The following table shows possible states:

VSC state	Meaning
Present	Operating normally.
Empty	Failed or removed *before* the agent started running.
Not Connected	This is for an SP. The 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. Or the SP failed or was removed *before* the agent started running.
Removed	Not present when the agent was started.

Conventions and Recommendations

None

Examples

navicli -d c1t0d0s1 -h server1 getcrus ↵

Output

Sample output follows. Actual output varies depending on the storage-system type and switches used with the **getcrus** command.

```
DPE Enclosure 0
SP A State:                              Present
SP B State:                              Present
Enclosure 0 Fan A State:                 Present
Enclosure 0 Fan B State:                 Present
Enclosure 0 Power A State:               Present
Enclosure 0 Power B State:               Present
Enclosure 0 SPS A State:                 Present
Enclosure 0 SPS B State:                 Empty
Enclosure 0 LCC A State:                 Present
Enclosure 0 LCC B State:                 Present

DAE Enclosure 1
Enclosure 1 Fan A State:                 Present
Enclosure 1 Power A State:               Present
Enclosure 1 Power B State:               Present
Enclosure 1 LCC A State:                 Present
Enclosure 1 LCC B State:                 Present
```

The **getcrus** display for an CX-Series or FC4700-Series system includes the bus number, 0 or 1, for each enclosure.

getdisk

Gets disk status

Description

The **getdisk** command returns detailed status information about all or selected disks in the system.

User Access

Anyone who can log in to the host running the Navisphere CLI.

Format

getdisk is used with **navicli** (described on page 2-12) as follows:

getdisk [-disk] [-bind] [-bndcrs] [-bytrd] [-bytwrt] [-capacity] [-cpn] [-hr] [-hs] [-hw] [-lun] [-numluns] [-private] [-product] [-rb] [-read] [-rds] [-rev] [-rg] [-rr] [-rs] [-serial] [-sig] [-sr] [-state] [-sw] [-ti] [-type] [-vendor] [-vr] [-write] [-wrts]

The optional switches are

-disk

Returns status for a specific disk.

For a storage system with Fibre Channel disks:
disk has the format *b/l_e_d*, where:
b/l = bus or loop number (0 or 1); needed only for bus 1 on an CX-Series or FC4700-Series storage system; omit otherwise.
e = enclosure number (in hex, always 0 for DPE) and
d = disk number in the enclosure.
For example, 2_3 represents enclosure 2 disk 3.
Valid enclosure values are hex numbers 0 through 9, A (hex representation for 10), and B (hex representation for 11). Valid disk numbers are 0 through 14 for CX-Series systems, 0 through 9 for other systems. For details, see *LUN IDs, Unique IDs, and Disk IDs*, page 2-5.

For a storage system with SCSI disks:
disk has the format *bd*, where:
b = SCSI bus letter (A through E) and
d = disk number on the SCSI bus.
For example, B3 represents SCSI bus B disk 3.

Valid SCSI bus letters and disk numbers are as follows.

30-Slot Chassis

SCSI Bus	Disk Position	Disk ID
A	0, 1, 2, 3, 4, 5	A0, A1, A2, A3, A4, A5
B	0, 1, 2, 3, 4, 5	B0, B1, B2, B3, B4, B5
C	0, 1, 2, 3, 4, 5	C0, C1, C2, C3, C4, C5
D	0, 1, 2, 3, 4, 5	D0, D1, D2, D3, D4, D5
E	0, 1, 2, 3, 4, 5	E0, E1, E2, E3, E4, E5

20-Slot Chassis

SCSI Bus	Disk Position	Disk ID
A	0, 1, 2, 3	A0, A1, A2, A3
B	0, 1, 2, 3	B0, B1, B2, B3
C	0, 1, 2, 3	C0, C1, C2, C3
D	0, 1, 2, 3	D0, D1, D2, D3
E	0, 1, 2, 3	E0, E1, E2, E3

10-Slot Chassis

SCSI Bus	Disk Position	Disk ID
A	0, 1, 2, 3, 4	A0, A1, A2, A3, A4
B	0, 1, 2, 3, 4	B0, B1, B2, B3, B4

When the *disk* 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). (This switch replaces the CLARVOiiANT **diskstat** command.)

-bytrd

Returns the number of Kbytes read.

-bytwrt

Returns the number of Kbytes written.

-capacity

Returns the disk capacity in Mbytes.

-cpn

Returns the storage-system part number (string value) or N/A.

-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 page 2-105.

-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.

-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.

-private

Returns size, in blocks, of the private space 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.

-rr

Returns the total number of times read and write requests to the disk module were retried. Not supported on CX-Series systems.

-rs

Returns the total number of disk sectors that were faulty when written to, and thus were remapped to a different part of the disk module. Not supported on CX-Series systems.

-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.

-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.

-ti

Returns the disk service time string value. Not supported on CX-Series systems.

-type

Returns the RAID type of the disk.

-vendor

Returns the vendor ID of the disk.

-wr

Returns the total number of times write requests to the disk module were retried. Not supported on CX-Series systems.

-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.

Conventions and Recommendations

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 storage 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.
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 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.

State	Meaning
Removed	Removed from the chassis; applies only to a disk module that is part of a LUN.
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.

Examples

For CX-Series or FC4700-Series

navicli -h ss1_spa getdisk -1_1_1 ↵

Returns information for disk 1 in disk array enclosure 1 (DAE or DAE2 number 1) on bus 1.

For pre-FC4700-Series

navicli -d c1t0d0s2 -h server1 getdisk -1_1 ↵

Returns information for disk 1 in disk array enclosure 1 (DAE 1).

Output

The following is a sample output. Actual output varies depending on the switches you use with the **getdisk** command.

```
Bus 0 Enclosure 0 Disk 0
Vendor Id:             SEAGATE
Product Id:            ST336704 CLAR36
Product Revision:      3A90
Lun:                   0 1 2 3 4 5 6 7 12 13 14 15 16 17
Type:                 0: RAID5 1: RAID5 2: RAID5 3: RAID5
4: RAID5 5: RAID5 6: RAID5 7: RAID5 12: RAID5 13: RAID5
14: RAID5 15: RAID5 16: RAID5 17: RAID5
State:                 Enabled
Hot Spare:            0: NO 1: NO 2: NO 3: NO 4: NO 5: NO
6: NO 7: NO 12: NO 13: NO 14: NO 15: NO 16: NO 17: NO
Prct Rebuilt:          0: 100 1: 100 2: 100 3: 100 4: 100
5: 100 6: 100 7: 100 12: 100 13: 100 14: 100 15: 100 16:
100 17: 100
Prct Bound:            0: 100 1: 100 2: 100 3: 100 4: 100
5: 100 6: 100 7: 100 12: 100 13: 100 14: 100 15: 100 16:
100 17: 100
Serial Number:         3CD20B8P
Sectors:               7340032 (3758)
Capacity:              37180
```

```
Private:               0: 577536 1: 577536 2: 577536 3:
577536 4: 577536 5: 577536 6: 577536 7: 577536 12: 577536
13: 577536 14: 577536 15: 577536 16: 577536 17: 577536
Bind Signature:        0x4594, 0, 0
Hard Read Errors:      0
Hard Write Errors:     0
Soft Read Errors:      0
Soft Write Errors:     0
Read Retries:          0
Write Retries:         0
Remapped Sectors:      0
Number of Reads:       0
Number of Writes:      0
Number of Luns:        14
Raid Group ID:         0
Clariion Part Number:
Request Service Time: 0 ms
Read Requests:         0
Write Requests:        0
Kbytes Read:           0
Kbytes Written:        0
Stripe Boundry Crossing: 0
.
Statistics logging is disabled.
Certain fields are not printed if statistics
logging is not enabled.
```

getlog

Gets an SP or Event Monitor log

Description

The **getlog** command returns the entire SP or Event Monitor log (default), the newest entries to the log, or the oldest entries to the log.

IMPORTANT: Depending on the size of the log, the **getlog** command may take several minutes to execute.

For a CX-Series or FC4700-Series storage system, each SP is a host (**-h** switch) to which you address the command. 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. If the Agent from which you need Event Monitor information is not running, or if you want to read a stored Event Monitor log, use the **convertEMlog** command.

User Access

Anyone who can log in to the host running the Navisphere CLI.

Format

getlog is used with **navicli** (described on page 2-12) as follows:

getlog [**-em**] [**-fe** *ecode-value*] [**ecode** *ecode-value*] [**-h**] [+*n*] [-*n*]

For a host not attached (through a switch or HBA) to a storage system, use **getlog -em .**

The optional switches are

-em

Displays the Event Monitor log. If you omit this switch, the CLI displays the SP log (for pre-FC4700) or the Event Monitor log (for a CX-Series or FC4700-Series).

-fe *ecode-value*

Displays the filtered log based on Extended Status Code *ecode-value*. It is not supported on CX-Series or FC4700-Seriess. (This switch replaces a function of the CLARVOiiANT **log** command.) Not supported on CX-Series or FC4700-Series systems.

-ecode *ecode-value*

Displays the filtered log based on event code *ecode-value*, explained in the Storage System and SP Event Code reference. (This switch replaces a function of the CLARVOiiANT **log** command.) It is not supported on CX-Series or FC4700-Series SPs. Not supported on CX-Series or FC4700-Series systems.

-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.

Conventions and Recommendations

None

Examples

navicli -d c1t0d0s1 -h server1 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
```

Output

See above.

getloop

Gets fibre loop information

This command applies only to Fibre Channel storage systems.

Description

The **getloop** command returns information about the fiber loop.

This command is not valid for IRIX hosts.

User Access

Anyone who can log in to the host running the Navisphere CLI.

Format

getloop is used with **navicli** (described on page 2-12) as follows:

getloop [-clfo] [-conn] [-dlf] [-icl] [-ple] [-spf]

The optional switches are

-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.

Conventions and Recommendations

None

Examples **navicli -d c1t0d0s2 -h server1 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
```

Output See above.

getlun

Gets LUN information

Description

The **getlun** command returns information about a LUN and the CRUs that make up that LUN.

For CX-Series or FC4700-Series storage systems, values returned for fields noted with an asterisk (*) below may not be correct. Use Navisphere 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).

User Access

Anyone who can log in to the host running the Navisphere CLI.

Format

getlun is used with **navicli** (described on page 2-12) as follows:

getlun *lun* **[-aa] [-addroffset] [-at]**
[-bind] [-bp*] [-bread] [-brw *] [-busy] [-bwrite] [-capacity] [-crus]**
[-default] [-disk] [-element] [-ena] [-ff*] [-hrdscsi]**
[-idle] [-idt] [-it] [-mirrorname] [-mp][-mt] [-name] [-nminus]
[-offset] [-owner]
[-pd] [-pic] [-prb] [-prefetch] [-prf] [-ps] [-private] [-psm]
[qavg] [qmax**] [-que]**
[-rb] [-rc] [-rchm*] [-rd3] [-reads] [-remap**] [-ret] [-rg] [-rh*]**
[-rhist*] [-rr] [-rwf] [-rwr*]**
[-sftscsi] [-service] [-snapshot] [-srcp] [-ss] [-ssm] [-state] [-stripe]**
[-totque] [-type] [-stripe] [-uid] [-upb] [-verify]
[-was] [-wc] [-wch*] [-wh*] [-whist*] [-wr] [-writes**]**

where

lun

Specifies the logical unit on which to report. The *lun-number* specifies the logical unit number (0-31 for non-RAID Group storage systems, 0-222 for all RAID Group storage systems except for CX-Series, 0-1023 for CX-Series RAID Group storage systems). If no LUN number is specified, the CLI reports on all LUNs in the storage system.

The optional switches are

-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.

-brw *

Returns the number of host block read and write requests.

-busy**

Returns the percentage of time that the disk is busy.

-bwrite**

Returns the number of blocks written for each CRU.

-capacity

Returns, in Mbytes, 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.

-element

Returns, in blocks, the stripe size. The stripe size is the number of sectors that the storage 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.

-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. (This switch replaces a function of the CLARVOiiANT **luncachestat** command.)

-idle**

Returns the percentage of time that the LUN is idle.

-idt

Returns, in 100-ms units, the idle delay time for caching. For example, 5 equals 500 ms.

-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.

-mirrorname

Returns the MirrorView mirror name.

-mp

Returns the absolute maximum number of disk blocks to prefetch in response to a read request for variable-length prefetching.

-name

Returns the LUN name. This switch applies only to storage systems running a version of Core Software that supports Storage Group commands. LUN names are displayed in the GUI. You cannot use the LUN name as a CLI command argument.

The **-name** switch applies only to shared storage systems.

-nminus

Returns the status of minimal-latency read support (is or is not supported).

-offset

Returns the stripe number in the RAID Group at which the LUN starts.

-owner

Returns the name of the SP that currently owns the LUN.

-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. Prefetch types are:

0 = Disabled prefetch type (default)
1 = Constant-length prefetch type
2 = Variable-length prefetch type

-prf

Returns the percentage of read requests that caused a flush.

-ps

Returns the prefetch size/multiplier (the amount of data prefetched for one host read request). For constant-length prefetching, it gets the read request in blocks. For variable-length prefetching, it gets the multiplier used to calculate the amount of data to prefetch. For example, if the prefetch size is 8, the amount of data to prefetch is 8 times the amount of data requested.

-private

Returns information on all private LUNs in the storage system.

-psm

Same as **-ps**.

-qavg**

Returns the average queue depth for each CRU. Not supported on CX-Series systems.

-qmax**

Returns the maximum queue depth for each CRU. Not supported on CX-Series systems.

-que

Returns the queue length, a number. (This switch replaces a function of the CLARVOiiANT **luncachestat** command.)

-rb

Returns the value for the rebuild priority (ASAP, High, Medium, or Low).

-rc

Returns the LUN's read cache state (enabled or disabled).

-rchm*

Returns status on read and write cache hits and misses. Not supported on CX-Series systems.

-rd3

Returns the RAID 3 memory allocation, a number, or N/A. (This switch replaces a function of the CLARVOiiANT **lun** command.)

-reads**

Returns the number of reads received for each CRU.

-remap**

Returns the number of remapped sectors. Not supported on CX-Series systems.

-ret

Returns the priority for retaining prefetched data when the read cache becomes full. If the value returned is 1, prefetched data has priority over host-requested data. If the value returned is 0, both data types have the same priority.

-rg

Returns the RAID Group ID.

-rh*

Returns the read hit info if statistics logging is enabled. Not supported on CX-Series systems.

-rhist*

Returns Read Histogram information. Read Histogram is an array of 10 locations that contain the number of reads. Element n of the array contains the number of reads that were larger than or equal to 2n-1 and less than 2n 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.

-rr**

Returns the total number of times read requests to all the disk modules in the LUN were retried. Not supported on CX-Series systems.

-rwf

Returns the percentage of write requests that caused a cache flush.

-rwr*

Returns the number of host read and write requests.

-service**

Returns the average service time for each CRU. Not supported on CX-Series systems.

-sftscsi

Returns the total number of soft (correctable) errors. (This switch replaces a function of the CLARVOiiANT **luncachestat** command.)

-snapshot (CX-Series or FC4700-Series only)

Returns the number of SnapView snapshots (copy images on which a SnapView session is active).

--srcp

Returns the read cache configuration.

-ss

Returns the prefetch segment size; that is, the size of the segments that make up a prefetch operation. For constant-length prefetching, **-ss** returns the segment size (in blocks) of data prefetched in one read operation from the LUN. For variable-length prefetching, **-ss** 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 is 4, the segment size is 4 times the amount of data requested.

-ssm

Returns the prefetch segment size/multiplier; that is, the size of the segments that make up a prefetch operation. For constant-length prefetching, **-ssm** returns the segment size (in blocks) of data prefetched in one read operation from the LUN. 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, Transitioning, or bound.

-stripe

Returns the number of times an I/O crossed a stripe boundary on a RAID 5, RAID 0, or RAID 1/0 LUN.

-totque

Returns the total queue length, a number. (This switch replaces a function of the CLARVOiiANT **luncachestat** command.)

-type

Returns the RAID type of the LUN as follows:
RAID 0 - nonredundant individual access array
RAID 1 - mirrored pair
RAID 3 - parallel access array
RAID 5 - individual access array
RAID 1/0 - mirrored RAID 0 group
Disk - individual unit
Hot Spare - hot spare

-uid

Returns the Storage Group unique ID. This switch applies only to storage systems running Access Logix (which supports Storage Groups).

-upb*

Returns the number of prefetched blocks not used by the read cache.

-verify

Returns the value for the rebuild 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).

-wch*

Returns the number of times that a write was completely satisfied by the cache, avoiding a disk operation.

-service**

Returns the average service time for each CRU. Not supported on CX-Series systems.

-wh*

Returns the write hit information, if statistics logging is enabled.

-whist*

Returns write histogram information. Write Histogram is an array of 10 locations that contain the number of writes. Element n of the array contains the number of reads that were larger than or equal to 2n-1 and less than 2n 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. **whist** also displays the write histogram overflows, which are the number of writes that were larger than 512 blocks.

-wr**

Returns the total number of times write requests to all the disk modules in the LUN were retried. Not supported on CX-Series systems.

-writes**

Returns the number of writes received for each CRU.

Conventions and Recommendations

None

Examples

For pre-FC4700:

navicli -d c1t0d0s1 -h server1 getlun 0 ↵

Retrieves information about LUN 0.

For CX-Series and FC4700-Series, example 1:

navicli -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
```

For CX-Series and FC4700-Series, example 2:

navicli -h ss1_spa getlun 13 ↵

(See sample listing following)

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
```

getrg (RAID Group)

Gets RAID Group information

Description

The **getrg** command returns information about the specified RAID Group.

If no RAID Group is specified, the command returns information about all RAID Groups.

User Access

Anyone who can log in to the host running the Navisphere CLI.

Format

getrg is used with **navicli** (described on page 2-12) as follows:

getrg *rgID* **[-disks] [-exdisks] [-legal] [-lunex] [-lunlist] [-lusc] [-maxd] [-maxl] [-pod] [-prcntdf] [-prcntex] [-state] [-tcap] [-type] [-ucap]**

where

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 storage system.

The optional switches are

-disks

Returns the state of disks in the RAID Group.

-exdisks

Returns information about which disks are expanding. Displays N/A for not expanding.

-legal

Returns information about which RAID types LUNs can be bound as on the specified RAID Group.

How the new LUNs can be bound 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 N/A 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.

-prcntdf

Returns the percent of defragmention that is complete.

-prcntex

Returns the percent of expansion that is complete.

-state

Returns 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 RAID Group type.

-ucap

Returns the free (unbounded) capacity of the RAID Group in blocks.

Examples

navicli -d c1t0d0s2 -h server1 getrg 1.↵

Retrieves information about RAID Group 1.

Output The following is a sample output. 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 0  Enclosure 0  Disk 0
                 Bus 0  Enclosure 0  Disk 1
                 Bus 0  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 1  Disk 0
                 Bus 0  Enclosure 1  Disk 1
                 Bus 0  Enclosure 1  Disk 3
                 Bus 0  Enclosure 1  Disk 2
List of luns:                                 0 2 3 7
Max Number of disks:                          16
Max Number of luns:                           32
Raw Capacity (Blocks):                        170795880
Logical Capacity (Blocks):                    153716292
Free Capacity (Blocks,non-contiguous):        113871492
Free contiguous group of unbound segments:    113871492
Defrag/Expand priority:                       Low
Percent defragmented:                         100
Percent expanded:                             100
Disk expanding onto:                          N/A
Lun Expansion enabled:                        NO
Legal RAID types:                             r5
```

getsniffer

Gets background verify reports

Description

The **getsniffer** command retrieves background verify reports. You must use the LUN number (*lun*) with **getsniffer**.

For a CX-Series or FC4700-Series storage system, each SP is a host (**-h** switch) to which you address the command. The command returns information only for the LUNs owned by the SP you specify.

User Access

Anyone who can log in to the host running the Navisphere CLI.

Format

getsniffer is used with **navicli** (described on page 2-12) as follows:

getsniffer *lun* **[-alltot] [-curr] [-nonv] [-rec]**

where

lun

Specifies the logical unit on which to report. *lun* specifies the logical unit number (0-31 for non-RAID Group storage systems, 0-222 for RAID Group storage systems). This switch is required.

The optional switches are

-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.

Conventions and Recommendations

None

Examples **navicli -d c1t0d0s1 -h server1 getsniffer 1** ↵

Retrieves the report of the active full unit verify operation for LUN 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
   ---------------------------------------------------
                        CorrectedUncorrectable
   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 SP revision and serial number information

Description

Displays SP identification information. (This command replaces the CLARVOiiANT **sp** command.) If you omit switches, it displays all configuration type information.

For a CX-Series or FC4700-Series storage system, each SP is a host (**-h** switch) to which you address the command.

User access

Anyone who can log in to the host running the Navisphere CLI.

Format

getsp is used with **navicli** (described on page 2-12) as follows:

getsp [**-type**] [**-sig**] [**-psig**] [**-rev**] [**-ser**] [**-mem**] [**-id**]

where

-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 SP serial number.

-mem

Displays the SP memory size.

-id

Displays the SP SCSI ID if available, otherwise displays N/A.

Conventions and Recommendations

Use the **getsp** command to display SP revision and signature information.

Examples **navicli -d clt0d0s2 -h server1 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
```

Output See above.

getsptime (CX-Series or FC4700-Series only)

Gets the date and time setting on each CX-Series or FC4700-Series SP system clock

Description The **getsptime** command displays the system time set on an SP. Times are the same on SPs, since the Base Software ensures that both SP clocks show the same time.

User Access Anyone who can log in to the host running the Navisphere CLI.

Format **getsptime** is used with **navicli** (described on page 2-12) as follows:

getsptime -sp a | b [-**M** *month-num*] [-**D** *day-num*] [**-Y** *year-num*] [-**h** *hour-num*] [**-m** *minute-num]*

where

-spa or **-spb**

Specifies the SP to get time on.

Examples **navicli -h data1_spa getsptime -spa** ↵

Output The SP date and time.

initializearray -createpsm (FC4700-Series only)

Creates the essential PSM LUN for storage-system operation

Description

For FC4700-Series storage systems only, the **navicli initializearray** command **-createpsm** function creates an essential PSM (persistent storage manager) LUN for storage-system operation. Generally the **-createpsm** function is needed only once, for first-time initialization of a storage system. Once the PSM LUN is created, it cannot be removed. If the PSM already exists, the CLI will return the error message `Configuration already exists`.

The Base Software requires the following information to create the PSM LUN: RAID type, disks to use for the LUN, and size. If you omit any item (described under Format), the Base Software will try to use a default. The PSM LUN must meet the following conditions

- It must be a redundant RAID type (RAID 5, RAID 3, RAID 1, or RAID 1/0).
- It must be on a RAID group whose drives are in the DPE.
- It must be on a RAID group that has at least one drive other than drive 000, 001, or 002.

If you omit the **-o** (override) option, the CLI displays the following message to confirm the creation:

```
Creation of PSM is one time operation. PSM cannot
be removed, replaced, or modified. Be sure that
selected raid type and disks are correct. Creation
of PSM requires size MB space that cannot be used
for any other purpose. Do you want continue
(y/n)[n]?
```

To continue, enter **y**; otherwise, enter **n**.

User Access

You must have a user entry in the Navisphere Agent configuration file.

Format

initializearray -createpsm is used with **navicli** (described on page 2-12) as follows:

initializearray -createpsm [**-raidtype** *RAID-type*] [**-disks** *disks*] [**-size** *size*] [**-o**]

where

-raidtype *RAID-type*

Specifies the RAID type for the disk. You can specify **r1** (RAID 1), **r1_0** (RAID 1/0), or **r5** (RAID 5). The default type is RAID 5.

-disks *disks*

Specifies the physical disks for the PSM. These disks must be in the DPE, which is enclosure 0. *disks* has the format *b/d_e_d*, where:
b/l = bus or loop number (0 or 1); needed only for bus 1 on an CX-Series or FC4700-Series storage system; omit otherwise.
e = enclosure number (in hex, always 0 for the DPE) and
d = disk number in the enclosure.
For example, 0_3 represents bus 0, enclosure 0, disk 3. Valid disk numbers are 0 through 9. For details, see *LUN IDs, Unique IDs, and Disk IDs*, page 2-5.

The default disks are first five disks in the DPE (0_0_0 through 0_0_4).

-size *size*

Specifies the LUN size, in Mbytes. The default is shown in the confirmation message.

-o

Execute the command without prompting for confirmation.

Conventions and Recommendations

None.

Example

navicli -h payroll_storage_SPA initializearray -createpsm ↵
(confirmation text as shown earlier)

For the SP with hostname **payroll_storage_SPA,** this command creates the PSM LUN.

Output

See previous page. If the version of Base Software running on the SP does not support this command, a `Not supported` error message is printed to **stderr**. Other errors:

```
RAID_GROUP_NOT_SUPPORTED
PSM_ALREADY_EXISTS
PSM_BROKEN
PSM_SIZE_TOO SMALL
PSM_INVALID_RAIDTYPE
PSM_INVALID_DISK
PSM_CANNOT_CREATERG
```

initializearray -list (FC4700-Series only)

Lists PSM LUN information

Description

The **navicli initializearray** command **-list** function displays information about the PSM LUN, in the following format:

`Raid Group ID:` *RAID-group-ID*

`Logical Units Used:` *LUN-in-the-PSM*

`List of disks:` *Disks-in-PSM*

User Access

Anyone who can log in to the host running the Navisphere CLI.

Format

initializearray -list is used with **navicli** (described on page 2-12) as follows**:**

initializearray -list

Conventions and Recommendations

None.

Example

navicli -h payroll_storage_SPA initializearray -list ↵

For the SP with hostname **payroll_storage_SPA,** this command lists PSM LUN information.

Output

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

```
PSM_BROKEN
PSM_DOESNOT_EXIST
```

inserttestevent

Inserts an event into the event monitor log to let you verify the accuracy of a template.

Description

The **navicli inserttestevent** command inserts a dummy event of code 0x2003 in the Navisphere Event Monitor 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.

User Access

Anyone who can log in to the host running the Navisphere CLI.

Format

inserttestevent is used with **navicli** (described on page 2-12) as follows**:**

inserttestevent

Conventions and Recommendations

None.

Example

navicli -h server1_spa inserttestevent ↵

For the host **server1_spa**, this command writes a test event into the Event Monitor log file.

lunmapinfo

Lists the LUNs attached to a host

Description

The **navicli lunmapinfo** command displays information about the physical and logical devices attached to a server. For CX-Series or FC4700-Series storage systems, you must specify the SP IP address. You can specify multiple addresses, separated by commas.

User Access

Anyone who can log in to the host running the Navisphere CLI.

Note that the **-h** (host) switch you specify after **navicli** specifies the actual server hostname, even for CX-Series or FC4700-Series storage systems. (In other commands, for CX-Series or FC4700-Series, the **-h** switch specifies the SP hostname.)

Format

lunmapinfo is used with **navicli** (described on page 2-12, but for the **-h** switch see the note above) as follows:

For CX-Series or FC4700-Series storage systems:

lunmapinfo [**-update** [**-o**]
or
lunmapinfo *sp-ip-address* [,*sp-ip-address* [, ...]]

For pre-FC4700 systems:

lunmapinfo [**-update** [**-o**]]

where

-update

Scans the I/O buses for any new devices/drives and does not report any LUN information. Because the scan may take a lot of time, the CLI prompts for confirmation unless you include the **-o** switch.

-o

Executes the command without prompting for confirmation.

Conventions and Recommendations

None.

Example for CX-Series/FC4700

navicli -h payroll lunmapinfo -update ↵

```
Refreshing the drive letter mapping for the host "<Host>"
involves scanning all the SCSI devices. This operation
may be time consuming and the performance of the array
may come down during this operation.
Continue (y/n)? y ↵

The LUN mappings have been successfully updated.
```

navicli -h payroll lunmapinfo 123.456.789.123 123.456.789.124 ↵

```
LOGICAL UNIT NUMBER 1
Current owner:                SP A
Default Owner:                SP A
Trespassed:                   NO
Logical Drives:           F:\
Physical Device:              \\.\PhysicalDrive1


Current owner:                SP A
Default Owner:                SP A
Trespassed:                   NO
Logical Drives:               F:\
Physical Device:              \\.\PhysicalDrive2
```

For the server with hostname **payroll** these commands update the LUN mapping information, and then list the LUN information for the SPs whose IP addresses are **123.456.789.123** and **123.456.789.124**.

Example for FC4500

navicli -h accounts lunmapinfo ↵

```
LOGICAL UNIT NUMBER 2
Current owner:                SP A
Default Owner:                SP A
Trespassed:                   NO
Logical Drives:               G:\
Physical Device:              \\.\PhysicalDrive1


LOGICAL UNIT NUMBER 11
Current owner:                SP B
Default Owner:                SP B
Trespassed:                   NO
Logical Drives:               F:\
Physical Device:              \\.\PhysicalDrive2
```

For the server with hostname **accounts**, this lists all LUN information. It does not update the LUN mapping.

Output

See above.

ndu -list (CX-Series or FC4700-Series only)

Describes installed SP driver software packages

ndu Background

The **ndu** command provides Non-Disruptive Upgrade on CX-Series or FC4700-Series storage systems. This command lets you install and upgrade storage-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 Base softre or Access Logix, MirrorView, Access Logix, and Snapview packages.

Use the **-list** function with no switches to display all the information about all software packages.

ndu -list Description

The **navicli ndu** command with the **-list** function and no switches displays information about all installed software packages. In an CX-Series or FC4700-Series system, each SP is a host, addressable by its hostname. 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.

User Access

Anyone who can log in to the host running the Navisphere CLI.

Format

ndu -list is used with **navicli** (described on page 2-12) as follows:

ndu -list [**-name** [*name*]] [**-rev**] [**-iscommitable**] [**-isrevertable**] [**-isactive**] [**-iscomplete**] [**-issystem**]

where

-name [*name*]

Without the *name* argument, displays only the names of packages; with *name*, displays information on the package *name*.

-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 installation is complete, no or not applicable if it is not.

-issystem

Displays yes if the package is a factory-supplied system driver, no if it is not.

Conventions and Recommendations

After listing installed driver packages, you can perform other **ndu** (non-disruptive upgrade) steps, such as **ndu commit**, **ndu revert**, or **ndu uninstall**.

Example

navicli -h payroll_storage_SPA ndu -list ↵

For the SP with hostname **payroll_storage_SPA,** this command lists all installed driver packages. For sample output, see previous page.

Output

See previous page. If the version of Base Software running on the SP does not support this command, a `Not supported` error message is printed to **stderr**.

ndu -install (CX-Series or FC4700-Series only)

Transfer SP software driver packages to the storage-system private LUN (PSM LUN)

Description

The **ndu** command with the **-install** function transfers files from media to the storage system, queries and displays information about the packages, and then installs or upgrades selected software packages.

The **navicli ndu** command **-install** function transfers one or more SP driver packages from a user-accessible file system to the storage-system private storage LUN (PSM). Media should be present before you issue this command.

You should use a Windows-based Navisphere client (either Navisphere Manager or Navisphere CLI) to install software on a CX-Series or FC4700-Series storage system.

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 non-disruptive 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 **navicli 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 storage system.

You can install more than one package with one **ndu** command.

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 system that has SnapView, Access Logix, and Base 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.
- Unless you used **-force**, 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.

User Access

You must have a user entry in the Navisphere Agent configuration file.

Format

ndu -install is used with **navicli** (described on page 2-12) as follows:

ndu -install *pathlist* {**-delay** *seconds*] [**-force**]

where

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 *seconds*

Specifies the delay time between the upgrade of the first SP and the second SP. This delay is required for any server running DMP (Dynamic MultiPath) software because the standard delay is too short for DMP's polling rate. Use this switch if any server attached to the storage system is running DMP. A sample general purpose delay is 240 seconds.

-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.

Conventions and Recommendations

Use the **navicli ndu -list** command to display installed package information. If the **ndu -install** command succeeds, the SPs restart.

Example

navicli -h payroll_storage_SPA ndu -install "G:\mirrorview-00_62_45.exe ↵

```
V:\cli -h payroll_storage_SPA ndu -install
   G\:mirrorview-00_62_45.exe
Item number:                          0
Name of the software package:         MirrorView
Revision of the software package:     5.3.0.9.0
Already Installed Revision            5.3.0.11.1
Installable                           YES
Disruptive upgrade:                   NO
Ndu delay:                            0
Uninstallable Reason:

Enter numbers of the packages to be installed separated
   by blanks.
Enter 'all' for all packages and 'quit' without
   installing:
```

0 ↵

For the SP with hostname **payroll_storage_SPA,** this command installs the MirrorView driver.

Output

If the version of Base 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 -commit (CX-Series or FC4700-Series only)

Commits (makes permanent) an installed storage-system driver package

Description

The **navicli 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.

User Access

You must have a user entry in the Navisphere Agent configuration file.

Format

ndu -commit is used with **navicli** (described on page 2-12) as follows:

ndu -commit *namelist*

where

namelist

Lists filenames of the software packages to be committed.

Conventions and Recommendations

Use the **navicli ndu -list** command to display installed package information.

Example

navicli -h payroll_storage_SPA ndu -commit mypackage ↵

For the SP with hostname **payroll_storage_SPA,** this command commits the installed package **mypackage**.

Output

If the version of Base Software running on the SP does not support this command, a `Not supported` error message is printed to **stderr**.

ndu -status (CX-Series or FC4700-Series only)

Returns the status of the ndu install, commit, or revert operations.

Description

The **navicli ndu** command **-status** function reports the progress of the last **ndu install**, **commit**, or **revert** function executed.

User Access

You must have a user entry in the Navisphere Agent configuration file.

Format

ndu -status is used with **navicli** (described on page 2-12) as follows:

ndu -status [**-clear**]

where

-clear

Clears the status of the last executed **ndu** command.

Conventions and Recommendations

Use the **navicli ndu -list** command to display installed package information.

Example

navicli -h payroll_storage_SPA ndu -status ↵

For the SP with hostname **payroll_storage_SPA,** this command reports the status of the **ndu install**, **commit**, or **revert** function.

Output

If the version of Base Software running on the SP does not support this command, a `Not supported` error message is printed to **stderr**.

ndu -revert (CX-Series or FC4700-Series only)

Returns to (restores functionality of) the previous revision of an installed storage-system driver

Description

The **navicli ndu** command **-revert** function restores the functionality of the previous revision of an installed driver package. A committed package cannot revert, 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.

User Access

You must have a user entry in the Navisphere Agent configuration file.

Format

ndu -revert is used with **navicli** (described on page 2-12) as follows:

ndu -revert [**-o**] *namelist*

where

-delay *seconds*

Specifies the delay time between the reversion of the first SP and the second SP. This delay is required for any server running DMP (Dynamic MultiPath) software because the standard delay is too short for DMP's polling rate. This switch is needed for servers running DMP only. A sample general purpose delay is 240 seconds.

namelist

Lists filenames of the software packages to be reverted.

-o

Executes the command without prompting for confirmation.

Conventions and Recommendations

Use the **navicli ndu -list** command to display installed package information.

Example

navicli -h payroll_storage_SPA ndu -revert mypackage ↵

For the SP with hostname **payroll_storage_SPA,** this command reverts to the previous revision of **mypackage** for both SPs.

Output

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

```
NDU_CANNOT_FIND_FILE
NDU_CANNOT_XFER_FILE
INVALID_PACKAGE
```

networkadmin -get (CX-Series or FC4700-Series only)

Lists CX-Series or FC4700-Series network name and address information

Description

The **navicli networkadmin** command **-get** function without switches lists all network information for an CX-Series or FC4700-Series SP. Issue the command to the SP for which this information is needed. In a CX-Series or FC4700-Series system, each SP is a host, addressable by its hostname.

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*

User Access

Anyone who can log in to the host running the Navisphere CLI.

Format

networkadmin -get is used with **navicli** (described on page 2-12) as follows:

networkadmin -get [**-name**] [**-address**] [**-gateway**] [**-subnetmask**]

where

-name

Displays the SP's network name.

-address

Displays the SP's network IP address.

-gateway

Displays the IP address of the SP's gateway system.

-subnetmask

Displays the SP's subnet mask.

Conventions and Recommendations

If you need to change an SP network name or address, you can do so with the **networkadmin -set** function described on page 2-154.

Example

navicli -h payroll_storage_SPA networkadmin -get ↵
...

navicli -h payroll_storage_SPB networkadmin -get ↵
...

For each SP in a CX-Series or FC4700-Series storage system, these commands list all network information.

Output

See previous page. If the version of Base Software running on the SP does not support this command, a `Not supported` error message is printed to **stderr**.

networkadmin -set (CX-Series or FC4700-Series only)

Updates network information for an CX-Series or FC4700-Series SP

The network properties are initially set by EMC service personnel 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 will restart and use the new value.

Description

The **navicli networkadmin** command **-set** function changes one or more network settings for a CX-Series or FC4700-Series SP. Issue the command to the SP whose information you want to update. In an CX-Series or FC4700-Series system, each SP is a host, addressable by its hostname.

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**.

User Access

You must have a user entry in the Navisphere Agent configuration file.

Format

networkadmin -set is used with **navicli** (described on page 2-12) as follows:

networkadmin -set [**-name** *name*] [**-address** *IP-address*] [**-gateway** *gateway-IP-address*] [**-subnetmask** *mask*] [**-o**]

where

-name *name*

Changes the SP's network name to *name*. The maximum size of the name is 64 characters.

-address *IP-address*

Changes the SP's IP address to *IP address*.

-gateway *gateway-IP-address*

Changes the SP's gateway IP address to *gateway-IP-address*.

-subnetmask *mask*

Changes the SP's subnet mask to *mask.*

-o

Executes the command without prompting for confirmation.

Conventions and Recommendations

To discover current settings, use the **networkadmin -get** function.

Example

navicli -h payroll_storage_SPA networkadmin -set -gatewayaddress 123.456.789.012 ↵

```
Changing the gateway address of SP A from 123.456.789.011
to 123.456.789.011 (y/n)[n] y ↵
```

SP A reboots

For the SP with hostname **payroll_storage_SPA** this command changes the gateway address.

Output

See above. If the version of Base 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
```

r3wrbuff (FC5400/5500 only)

Enables or disables RAID 3 write buffering

Description

The **r3wrbuff** command sets the state of RAID 3 write buffering. If there are no parameters, the command will return the current status of RAID 3 write buffering.

User Access

You must have a user entry in the Navisphere Agent configuration file, and if configuration access control is enabled, you must issue the command from a trusted server (see *accesscontrol (FC4500 and FC5300)* on page 3-3).

Format

r3wrbuff is used with **navicli** (described on page 2-12) as follows:

r3wrbuff [-on | -off]

where

-on

Enables RAID 3 write buffering.

-off

Disables RAID 3 write buffering.

Conventions and Recommendations

None

Examples

navicli -d c1t0d0s1 -h server1 r3wrbuff -on ↵

Output

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

readcru (pre-FC4700 only)

Reads disk blocks from a disk and copies them to a file

Description

Reads block data from a disk module and copies the data to a disk file whose pathname you specify. The CLI will create the file if it does not exist. The pathname must be in a LUN accessible to the Agent. (This command replaces the CLARVOiiANT **readcru** command.)

User access

Anyone who can log in to the host running the Navisphere CLI.

Format

readcru is used with **navicli** (described on page 2-12) as follows:

readcru -crunname *diskID* **-blocks** *num-blocks* [**-startLBA** *disk-address-hex*] **-pathname** *pathname*

where

-cruname *diskID*

Specifies the disk ID. Use the form *b_e_d*, as explained in the section *LUN IDs, Unique IDs, and Disk IDs*, page 2-5.

-blocks *num-blocks*

Specifies the number of 512-byte disk blocks to read.

-startLBA *disk-address-hex*

Specifies the starting disk address, in hexadecimal. If you omit this switch, the read starts at block 0 of the disk.

-pathname *pathname*

Specifies the full pathname of the file to which the CLI will copy the disk blocks.

Conventions and recommendations

None.

Examples

navicli -d clt0d0s2 -h server1 readcru -cruname 0_0 -blocks 2 -pathname c:\temp\disk.txt ↵

This command reads two blocks of disk 0 located in enclosure 0 starting from address 0 into file **disk.txt** in directory **c:\temp**.

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

```
BLOCKS_REQUIRED
DIRECTORY _REQUIRED
INVALID_BLOCKS
READ_NOT_SUPPORTED
VALID_VALUES_1_128
```

readlun (pre-FC4700 only)

Reads one disk block from a LUN and copies it to a file

Description

Reads one block from a LUN and copies its data to a disk file whose pathname you specify. The command exists to break the Ready/Ready condition of a storage system.

The CLI will create the file if it does not exist. The pathname must be in a LUN accessible to the host Agent. (This command replaces the CLARVOiiANT **readlun** command.)

User access

Anyone who can log in to the host running the Navisphere CLI. Write access to the destination directory is required.

Format

readlun is used with **navicli** (described on page 2-12) as follows:

readlun -lun *lun-num*
[**-startLBA** *disk-address-hex*] **-pathname** *pathname*

where

-lun *lun-num*

Specifies the LUN ID assigned when the LUN was created. LUN IDs range from 0 through 222 (Fibre Channel) or 0 through 31 (SCSI).

-startLBA *disk-address-hex*

Specifies the starting disk address, in hexadecimal. If you omit this switch, the read starts at block 0 of the LUN.

-pathname *pathname*

Specifies the full pathname of the file to which the CLI will copy the disk block.

Conventions and Recommendations

None.

Example

navicli -d clt0d0s2 -h server1 readlun -lun 0 -pathname c:\temp\disk.txt ↵

This command reads the starting disk block of LUN 0 into file **disk.txt** in directory **c:\temp**.

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

```
DIRECTORY _REQUIRED
```

rebootSP

Reboots an SP

Description

This command reboots one or both SPs. If you omit switches, the current SP is rebooted.

If **rebootSP** is executed while I/O processes are active, I/O errors may occur and/or the Navisphere Agent process may hang. If the Agent process hangs, you will need to reboot the host on which the Navisphere 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.

User Access

You must have a user entry in the Navisphere Agent configuration file. For any pre-FC4700 storagr system, if configuration access control is enabled, you must issue the command from a trusted server (see *accesscontrol (FC4500 and FC5300)* on page 3-3).

Format

rebootSP is used with **navicli** (described on page 2-12) as follows:

rebootSP [-both] [-o]

The optional switches are

-both

Reboot both SPs.

-o

Does not prompt the user for permission.

Conventions and Recommendations

None

Examples

navicli -d c1t0d0s2 -h server1 rebootSP -both -o↵

Output

None

remoteconfig -getconfig

Displays information about a host or SP Agent

remoteconfig Background

The **navicli 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 storage system on a remote host, and stop the Agent running on a host.

Description

The **navicli remoteconfig** command with **-getconfig** displays information on the Agent running on the specified host or, for a CX-Series or FC4700-Series storage system, on an SP. 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.

The format of the display follows. Entries marked with an asterisk (*) do not appear for a CX-Series or FC4700-Series SP.

`Description:`	Description of host.
`Contact Person:`	Name and phone number of person managing the Agent.
`*Device Connections:`	Displays following device info through Comments (does not apply to CX-Series or FC4700-Series storage systems).
`*Device Name:`	Name of device, such as **c1t3d0s2.**
`*Storage System:`	Storage-system name, such as storage1.
`*SP:`	ID of SP managing the device: A or B.
`*Comments:`	Any comments.
`*Connection Type:`	Connection: SCSI, tty, lan, and so on.
`Users:`	List of users by login name and host; for example, **jgarg@cpc3440.**
`Polling Interval:`	Interval in seconds, if applicable.
`*Serial Line Baud Rate:`	Baud rate, such as 9600, if applicable.
`*Log Entries to Transfer:`	Log size to transfer or all, if applicable.
`*Mega-Poll`	
`*Use explicit device names`	Enabled or Disabled.

User Access

Anyone who can log in to the host running the Navisphere CLI.

Format **remoteconfig -getconfig** is used with **navicli** (described on page 2-12) as follows:

remoteconfig -getconfig [-description] [-contact] [-dev] [-users] [-interval] [-baudrate] [-logsize] [-megapoll] [-useexplicitdevnames] [-write *filename*]

where

-description

Displays contents of description field.

-contact

Displays contents of contact field.

-dev

Displays contents of devices field (does not apply with a CX-Series or FC4700-Series storage system).

-users

Displays contents of users field.

-interval

Displays contents of polling interval field.

-baudrate

Displays contents of baud rate field (does not apply with a CX-Series or FC4700-Series storage system).

-logsize

Displays contents of log-entries-transfer field (does not apply with a CX-Series or FC4700-Series storage system).

-useexplicitdevicenames

Displays Enabled or Disabled (does not apply with a CX-Series or FC4700-Series storage system).

-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**.

Conventions and Recommendations

After listing Agent information, you can change the Agent settings with the **remoteconfig -setconfig** command.

Example

navicli -d c1t0d0s2 -h server1 remoteconfig -getconfig ↵

For storage system **c1t0d0s2** attached to host **server1**, this command lists all Agent information. For sample output, see page 2-162.

Output

See above. If the version of Core or Base 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 -scan (pre-FC4700)

Scans a storage system on a host and displays device information

Description

The **navicli remoteconfig** command with the **-scan** function displays information about storage systems attached to a host. (Compare with the **remoteconfig -getconfig** function on page 2-162, which lists devices in the configuration file.)

The **-scan** function does not apply to CX-Series or FC4700-Series storage systems.The display looks like this:

`Device Connections:`	Displays the following device info through Comments.
`Device Name:`	Name of device, such as **c1t3d0s2.**
`Storage System:`	Storage system name, such as ss1.
`Current SP:`	ID of SP managing the device: A or B.
`Comments:`	Any comments.
`Recommended`	A Yes or No value that indicates whether this device is recommended to be managed.

User Access

You must have a user entry in the Navisphere Agent configuration file. If configuration access control is enabled, you must issue the command from a trusted server (see *accesscontrol (FC4500 and FC5300)* on page 3-3).

Format

remoteconfig -scan is used with **navicli** (described on page 2-12) as follows:

remoteconfig -scan [-all]

where

-all

displays all Navisphere-manageable devices on the SCSI bus. Without the **-all** option, the CLI displays a complete list of devices (0 or more) found.

Conventions and Recommendations

After listing Agent information, you can change the Agent settings with the **remoteconfig -setconfig** command.

Example

navicli -d c1t0d0s2 -h server1 remoteconfig -scan ↵

For storage system **c1t0d0s2** attached to host **server1**, this command displays device information. For sample output, see above.

Output See above. If the version of Core or Base 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

Description

The **navicli remoteconfig** command with **-setconfig** changes the configuration information for the Agent running on the specified host or, with a CX-Series or FC4700-Series storage system, on an SP.

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. Some entries do not apply with a CX-Series or FC4700-Series SP.

```
Change host description from old to new <y/n>[y]?
Change contact information from  old to new <y/n>[y]?
Add device device to managed device list <y/n>[y] ?
Remove device device from managed device list <y/n>[y]?
Scan devices and manage all of them <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] ?
Change baud rate to baud-rate <y/n>[y]?
Change log size to size  <y/n>[y]?
Enable/Disable Mega-Poll <y/n>[y]?
Enable/Disable use of explicit device names <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.

User Access

You must have a user entry in the Navisphere Agent configuration file.

Format

remoteconfig -setconfig is used with **navicli** (described on page 2-12) as follows:

remoteconfig -setconfig [**-o**] [**-adduser** *userlist*] [**-baudrate** *rate*] [**-contact** *contactinfo*] [**-description** *description*] [**-f** *filename*] [**-interval** *interval*] [**-logsize** *size*] [**-manageauto**] [**-managedev** *devicelist*] [**-managelan** *devicelist*] [**-managetty** *devicelist*] [**-reloadconfig**] [**-rmuser** *userlist*] [**-unmanagedev** *devicelist*] [**-useexplicitdevnames 0|1**]

where

-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.

-baudrate *rate*

Changes the baud rate to *rate*. This switch does not apply to a CX-Series or FC4700-Series storage system.

-contact *contactinfo*

Specifies new contact information for the Agent description field.

-description *description*

Specifies new contents for the Agent description field.

-f *filename*

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 storage-system types.

-logsize *size*

Changes the maximum size of the SP log to *size*.This switch does not apply to an FC storage system.

-manageauto

Execute auto configuration; that is, manages all SCSI devices. This switch does not apply to a CX-Series or FC4700-Series storage system.

-managedev *devicelist*

Adds the specified SCSI devices to the Agent's managed device list. Every device is a three-item set of

device-osname,*storage-system-name*,[*description*]

Separate devices with a space. If you specify the **-manageauto** switch with **-managedev**, then the software will execute the **-managedev** option and display a warning message. This switch does not apply to a CX-Series or FC4700-Series storage system.

-managelan *devicelist*

Adds the LAN devices in the managed device list. Every device is a three-item set of

device-osname,*storage-system-name*,[*description*]

Separate devices with a space. If you specify the **-manageauto** switch with **-managedev**, then the software will execute the **-managedev** option and display a warning message. This switch does not apply to a CX-Series or FC4700-Series storage system.

-managetty *devicelist*

Adds the specified serial devices in the Agent's managed device list. Other information is the same as for **-managedev**. This switch does not apply to a CX-Series or FC4700-Series storage system.

-reloadconfig

Instructs the Agent to use any new values established by **remoteconfig -setconfig**. This switch lets you avoid stopping and restarting the Agent to force it to use the new values.

-rmuser *userlist*

Removes the specified users from the authorized user list.

-unmanagedev *devicelist*

Removes these devices from the managed device list. Separate devices (see **-managedev** for format) with a space. This option nullifies auto configuration if it is enabled for the device. This switch does not apply to a CX-Series or FC4700-Series storage system.

-useexplicitdevicenames 0 | 1

Disables (0) or enables (1) the use of explicit device names. This option does not apply to a CX-Series or FC4700-Series storage system.

Conventions and Recommendations

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.

Example **navicli -h server1 remoteconfig -setconfig -adduser tsjones@viking ↵**

```
Add tsjones@viking in the authorized user list <y/n>[y]?↵
```

For host **server1**, this command adds the user **tsjones** on host **viking** to the Agent privileged users list.

Output See page 2-167. If the version of Core or Base 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 (RAID Group)

Removes a RAID Group

Description The **removerg** command removes a specified RAID Group.

User Access You must have a user entry in the Navisphere Agent configuration file. For a pre-FC4700 storage system, if configuration access control is enabled, you must issue the command from a trusted server (see *accesscontrol (FC4500 and FC5300)* on page 3-3).

Format **removerg** is used with **navicli** (described on page 2-12) as follows:

removerg *rgID* [**-o**]

where

rgID

RAID Group identification number. *rgID* specifies a number between 0 and the maximum number of RAID Groups supported by the RAID Group storage system.

-o

Indicates not to prompt for verification of removal.

Conventions and Recommendations None

Examples **navicli -d c1t0d0s2 -h server1 removerg 1 -o** ↵

This command removes RAID Group 1 without prompting for verification of the removal.

Output None

responsetest

Tests Event Monitor response

Description

The **responstest** command creates an artificial event to test Navisphere Event Monitor response.

The **responsetest** command is designed for use without the Event Monitor Graphical User Interface (GUI). That is, you can use **responsetest** in conjunction 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 GUI 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 storage systems only. The EMC phone home feature is not available via this command.

User Access

You must have a user entry in the Navisphere Agent configuration file. For a pre-FC4700 storage system, if configuration access control is enabled, you must issue the command from a trusted server (see *accesscontrol (FC4500 and FC5300)* on page 3-3).

Format

responsetest is used with **navicli** (described on page 2-12) with one of the following arguments as follows:

responsetest -email *response-parameters* |
-emailpage *response-parameters* | **-modempage** *response-parameters* |
-snmp *response-parameters*

where

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*]
Specifies 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

-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* is the PC COM port number. 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 used by the Agent. The **initcommand** allows for some custom modem configuration before the data is sent to it. Optional.

-snmp

-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.

Conventions and Recommendations

None

Examples

navicli -d c1t0d0s2 -h server1 responsetest modempage -destnumber 15055678901 -msgnumber 19990124576 ↵

This command sends a modem page test event to host **server1**.

Output

Result of the test.

setcache

Sets SP cache or RAID 3 size information

Description

The **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.

User Access

You must have a user entry in the Navisphere Agent configuration file. For a pre-FC4700 storage system, if configuration access control is enabled, you must issue the command from a trusted server (see *accesscontrol (FC4500 and FC5300)* on page 3-3).

Format

setcache is used with **navicli** (described on page 2-12) as follows:

setcache [**-h** *high-watermark*] [**-l** *low-watermark*] [**-m** *mirror*]
[**-p** *page-size*] [**-r3a** *raid3-size-spa*] [**-r3b** *raid3-size-spb*]
[**-rsza** *read-cache-size-spa*] [**-rszb** *read-cache-size-spb*]
[**-rca** *read-cache-spa*] [**-rcb** *read-cache-spb*]
[**-wc** *write-cache*] [**-wsza** *write-cache-size-sp*]
[**-wszb** *write-cache-size-spb*]

The optional switches are

-h *high-watermark*

Sets the write cache high watermark. *high-watermark* specifies the percentage of dirty pages, which, when reached, causes the SP to begin flushing the cache. The default is 96 percent. A lower value causes the SP 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.

-l *low-watermark*

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, the SP stops flushing the cache. The default is 80 percent. 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.

-m *mirror*

Enables or disables cache mirroring as follows:
1 = Enables mirroring (the default)
0 = Disables mirroring
On a Fibre Channel (FC-Series) storage system, mirroring is always enabled; you cannot change this.

-p *page-size*

Sets, in Kilobytes, 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 Kilobytes for general UNIX file server applications, and 2 Kilobytes or 4 Kilobytes for database applications. It does not work if the read or write cache is enabled.

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*

For a non-4700 storage system: Sets the SP memory size, in Mbytes, 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 Mbytes of memory, you must set this field to 12 (6 + 6). If the storage system does not have any RAID 3 LUNs, this value should be 0.

For a CX-Series or FC4700-Series storage system, RAID 3 memory is allocated automatically; you cannot set it.

-r3b *raid3-size-spb*

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* Mbytes.

For read/write caching to function, the total size allocated to the read and write caches (together) must be at least 1 Mbyte (for pre-FC4700 storage systems) or 3 Mbytes (for CX-Series or FC4700-Series storage systems).

-rszb *read-cache-size-spb*

Sets the read cache size for SP B to *read-cache-size-spb* Mbytes.

-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*

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*

Enables or disables the write cache function. For *write-cache*:
0 = Disables write cache
1 = Enables write cache

-wsza *write-cache-size-spa*

Sets the write cache size for SP A to *write-cache-size-spa* Mbytes. The SP write cache sizes must be equal; therefore, setting the size for one SP system automatically sets the same size in the other SP. Also, see the note on sizes under **-rsza**.

-wszb *write-cache-size-spb*

Sets the write cache size for SP B. *write-cache-size-spb* specifies the size. See comments the under **-wsza**.

Conventions and Recommendations

You can use the **getsp** command to discover SP memory and the **getcache** command to discover cache settings.

For FC5400 storage systems, the sum of an SP's write cache size and optimized RAID 3 memory size must be less than or equal to the SP's front-end size. The sum of an SP's read cache size and optimized RAID 3 memory size must be less than or equal to the SP's back-end size. RAID 3 memory size must be the same for front and back ends.

Examples

navicli -h ss1_spa getsp -mem ↵

```
Memory Size For The SP:        930
```

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.

navicli -h ss1_spa setcache -wsza 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 Mbytes, enables write caching, sets a write cache page size of 8 Kbytes, sets a read cache size for each SP of 280 Mbytes, and enables read caching.

Output None

setfeature (FC4700-Series only)

Adds a software feature to a LUN controlled by an CX-Series or FC4700-Series SP (Navisphere 5.2 and 5.2.5 only).

Description

In Navisphere 5.2 and 5.2.5, the **navicli setfeature** command adds a software driver feature to a LUN owned by an FC4700-Series SP.

For Navisphere 5.3 and later, this command has no effect; it is retained for compatibility with earlier revisions.

User Access

You must have a user entry in the Navisphere Agent configuration file.

Format

setfeature is used with **navicli** (described on page 2-12) as follows:

setfeature -on|**-off -feature** *feature* **-lun** *lun*|**-lunuid** *uid*

where

-on or **off**

Adds or removes the feature.

-feature *feature*

Identifies the feature; for example, RM for remote mirroring.

-lun *lun* or **-lunuid** *uid*

Specifies the LUN. You can use the LUN number (0 - 222) or the LUN unique ID, UID (which is the World Wide Name, WWN).

Conventions and Recommendations

Effective with Navisphere 5.2 and 5.2.5 only.

Output

If the version of Core or Base 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
```

setloop (all except CX-Series)

Sets fibre loop information

This command applies only to Fibre Channel storage systems.

Description

The **setloop** command sets information about the fiber loop. This command is not supported on CX-Series systems.

User Access

You must have a user entry in the Navisphere Agent configuration file. For a pre-FC4700, if configuration access control is enabled, you must issue the command from a trusted server (see *accesscontrol (FC4500 and FC5300)* on page 3-3).

Format

setloop is used with **navicli** (described on page 2-12) as follows:

setloop [-**spfo** *n*] [-**ple** *n*]

The optional switches are

-**spfo** *n*

Enables or disables failover from this SP's back-end loop to the peer SP's back-end loop.
n is as follows:
0 = Disables failover
1 = Enables failover

-**ple** *n*

Sets this SP's back-end loop to public or private, specifying if failover is allowed on this SP's fibre loop. *n* is as follows:
0 = Fibre loop is public (failover allowed)
1 = Fibre loop is private (failover not allowed)

Examples

navicli -d c1t0d0s1 -h server1 setloop -spfo 1 -ple 0 ↵

navicli -d c1t0d0s2 -h server1 setloop -spfo 1 -ple 0 ↵

This example does the following:

- Specifies that the back-end loops on both SPs are public, thus allowing failover on each SP's back-end loop.
- Enables failover from each SP's back-end loop to the other SP's back-end loop.

Output

None

setraid5 (FC5400/5500 only)

Enables or disables mixed-mode RAID 5

Description

The **setraid5** command sets the state of mixed mode RAID 5. If there are no parameters, the command will return the current status of mixed mode RAID 5.

When mixed mode RAID 5 is disabled, bandwidth mode is enabled. When mixed mode RAID 5 is enabled, bandwidth mode is disabled.

User Access

You must have a user entry in the Navisphere Agent configuration file.

Format

Prior to executing this command, ensure that the memory partitions are set to zero and the caches are disabled.

setraid5 is used with **navicli** (described on page 2-12) as follows:

setraid5 [-on | off] [-o]

where

-on

Enables mixed mode RAID 5.

-off

Disables mixed mode RAID 5.

Conventions and Recommendations

-o

Executes the command without prompting for confirmation.

None

Examples

navicli -d c1t0d0s1 -h server1 setraid5 -on↵

Output

```
This operation will cause a storage subsystem reboot.
DO YOU WISH TO CONTINUE?   [n]   yes
Mixed mode RAID 5 is ENABLED.
```

setsniffer

Starts a background verify process or changes verify process parameters

Description

The **setsniffer** command starts a background verify process or changes the parameters for the verify process. You must use the LUN number (*lun*) and *sniff* switches with **setsniffer**.

For a CX-Series or FC4700-Series storage system, each SP is a host (**-h** switch) to which you address the command. The command works only with LUNs owned by the SP you specify.

User Access

You must have a user entry in the Navisphere Agent configuration file. For a pre-FC4700 storage system, if configuration access control is enabled, you must issue the command from a trusted server (see *accesscontrol (FC4500 and FC5300)* on page 3-3).

Format

setsniffer is used with **navicli** (described on page 2-12) as follows:

setsniffer *lun sniff* **[-bv]** [**-bvtime** *priority*] [**-cr**] [**-snrate** *rate*]

where

lun

Specifies the logical unit to change. *lun* specifies the logical unit number (0-31 for non-RAID Group storage systems, 0-222 for RAID Group storage systems). This switch is required.

sniff

Enables or disables the sniffer function.
sniff is as follows:
0 = Disables sniffer
1 = Enables sniffer

The optional switches are

-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.

-snrate *rate*

Specifies the sniff rate. *rate*, the rate at which sniffs are executed, is specified in 100-ms units. Valid values are 1 through 254.

Conventions and Recommendations

None

Examples

navicli -d c1t0d0s2 -h server1 setsniffer 0 1 -bv -bvtime high ↵

Enables sniffing on LUN 0, starts a background verify, and sets the verify priority to high.

Output

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

setspstime

Sets SPS or BBU battery test time

Description

The **setspstime** command sets the SPS battery test time. If no switches are specified, the command returns the current SPS battery test time.

For an FC4700 storage system, the SPS test time is displayed for the client's time zone. This is different from the time on a non-FC4700 storage system, where the SPS test time is displayed for the storage system's time zone. For an FC4700 storage system, you can determine the actual SPS test time by taking the time displayed, and factoring in the time difference between the time zone for the client's location and the time zone for the storage system's location.

User Access

You must have a user entry in the Navisphere Agent configuration file. For a pre-FC4700 storage system, if configuration access control is enabled, you must issue the command from a trusted server (see *accesscontrol (FC4500 and FC5300)* on page 3-3).

Format

setspstime is used with **navicli** (described on page 2-12) as follows:

setspstime [-d] [-h] [-m]

The optional switches are

-d

Sets the day (0-6, 0=Sunday).

-h

Sets the hour of the day (0-23, 0=12:00 AM).

-m

Sets the minute of the hour (0-59).

To set the SPS or BBU test time, all switches must be specified.

Examples

navicli -d c1t0d0s1 -h server1 setspstime -d 0 -h 1 -m 0 ↵

This example sets the SPS battery test time to Sunday at 1:00 AM.

Output

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

setsptime (CX-Series or FC4700-Series only)

Sets the CX-Series or FC4700-Series SP system clocks

Description

The **setsptime** command sets the system time of one or both SPs. Changing the time on one SP changes the time on the other, since the Base Software ensures that both SP clocks show the same time.

User Access

You must have a user entry in the Navisphere Agent configuration file.

Format

setsptime is used with **navicli** (described on page 2-12) as follows:

setsptime -spa | -spb *[-***M** *month-num]* [**-D** *day-num*] [**-Y** *year-num]* [**-h** *hour-num*] [**-m** *minute-num*]

where

-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).

Examples

navicli -h data1_spa setsptime -M 3 -D 13 -Y 2002 -h 9 ↵

This example sets the SP system clock to March 13, 2002, 9:00 am.

Output

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

setstats

Sets statistics logging

Description

The **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 storage-system caching that you can turn on and off. When enabled, logging affects storage-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.

For a CX-Series or FC4700-Series storage system, each SP is a host (**-h** switch) to which you address the command. The command affects only the SP you specify.

User Access

You must have a user entry in the Navisphere Agent configuration file. For a pre-FC4700 storage system, if configuration access control is enabled, you must issue the command from a trusted server (see *accesscontrol (FC4500 and FC5300)* on page 3-3).

Format

setstats is used with **navicli** (described on page 2-12) as follows:

setstats [**-on** | **off**]

where

-on

Enables statistics logging.

-off

Disables statistics logging.

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.

Conventions and Recommendations

None

Examples

navicli -d c1t0d0s2 -h server1 setstats -on ↵

Output

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

spportspeed (CX-Series or FC4700-2 only)

Set or get the SP port speed

Description

The **spportspeed** command gets or sets the SP port speed. It has meaning only for a storage system that has SPs capable of running at 2 Gbits per second, called 2-Gbit mode (offered on CX-Series and model FC4700-2). You can set the port speed on either SP directly or through the other SP.

For 2-Gbit mode to work, the HBA, switch, and SP must all support 2-Gbit mode. By default, the SP is set to run in 1 Gbit-mode, which works with all HBAs and switches.

You can set the ports of an SP to different speeds if the ports connect to switches or HBAs with different speeds.

For a CX-Series or FC4700-Series storage system, each SP is a host (**-h** switch) to which you address the command. The command affects only the SP you specify.

WARNING

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
storage system, supports the new speed. If the
speed settings are incompatible, the storage 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 ot n Gigabit <y/n>?
```

User Access

You must have a user entry in the Navisphere Agent configuration file.

Format

spportspeed is used with **navicli** (described on page 2-12) as follows:

spportspeed -get

or

navicli -h hostname spportspeed -set -sp a|-b –portid 0|1 1|2

where

-sp a|b

Specifies the SP to set the port speed on.

-portid 0|1| 2 | 3

Specifies the port on the SP (**0**, **1**, **2**, or **3**).

1|2

Specifies the port speed: **1** for 1-Gbit mode; **2** for 2-Gbit mode. See the warning above.

Conventions and Recommendations

None

Examples

navicli -h payroll__spa spportspeed -get ↵

```
Storage Processor :   SP A
Port ID :             0
Speed Value :         1

Storage Processor :   SP A
Port ID :             1
Speed Value :         2

Storage Processor :   SP B
Port ID :             0
Speed Value :         2

Storage Processor :   SP B
Port ID :             1
Speed Value :         2
```

navicli -h payroll_spa spportspeed -set sp a -portid 0 2 ↵

```
Changing the port speed is a disruptive function.
Verify that the other device connected to the
storage system, supports the new speed. If the
speed settings are incompatible, the storage 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 ↵
```

The **get** command displays the port speeds of the SP **payroll_spa** and its peer SP. The **set c**ommand sets the SP port speed of SP A port 0 to 2 Gbits/second.

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

```
VALID_VALUES_1_2
```

systemtype

Sets the storage-system type

Description

The **systemtype** command changes the configured storage-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.

User Access

You must have a user entry in the Navisphere Agent configuration file. For a pre-FC4700 storage system, if configuration access control is enabled, you must issue the command from a trusted server (see *accesscontrol (FC4500 and FC5300)* on page 3-3).

Format

systemtype is used with **navicli** (described on page 2-12) as follows:

systemtype [**-config** [*type*] **[-o]**

The optional switches are

-config [*type*]

Sets the storage-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 - CLARiiON open storage system (default)

9 - SGI (FC4700 or CX600)

13 - Dell

16 - Fujitsu

17 - SGI (FC5500)

1C - Compaq Tru64 type

-o

Indicates not to prompt for verification.

Conventions and Recommendations

Depending on the type of HP-UX operating system, you may want auto-trespass to be on or off.

Examples

navicli -d c1t0d0s1 -h server1 systemtype ↵

```
The configured system type is: 0x3
The current system type is: 0x3
```

navicli -d c1t0d0s1 -h server1 systemtype -config 2 ↵

```
In order for this command to execute, write cache
must be disabled and memory size set to zero:
navcli -d devicename -h hostname setcache -wc 0.
This operation will cause a storage system reboot!
DO YOU WISH TO CONTINUE? (y/n) y ↵
```

This example sets the storage-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.

Output

Shown above.

trespass

Trespasses one or more LUNs to control of an SP

Description

This command trespasses one or more LUNs to control of an SP.

For a CX-Series or FC4700-Series storage system, each SP is a host (**-h** switch) to which you address the command. The command attempts to trespass all specified LUNs to the SP you specify with the **-h** switch.

IMPORTANT: If **trespass** is executed while I/O processes are active, I/O errors may occur.

User Access

You must have a user entry in the Navisphere Agent configuration file.

Format

trespass is used with **navicli** (described on page 2-12) as follows:

trespass [**all** | **lun** *lun-number* | **mine** | **rg** *rgID*]

where

all

Trespasses on all LUNs in the system.

lun *lun-number*

Trespasses on one LUN (specified in *lun-number*).

mine

Performs whatever trespassing is necessary to take all of the LUNs that have this SP as a default owner.

rg *rgID*

Trespasses on all LUNs in the specified RAID Group. The RAID Group trespass functionality works with all storage system types except CX-Series.

Conventions and Recommendations

None

Example

navicli -d c1t0d0s2 -h server1 trespass all ↵

Output

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

unbind

Deconfigures a LUN

Description

The **unbind** command deconfigures LUNs from their current logical configuration. **unbind** 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. If you do not want the prompt to appear, you can override prompting using the **-o** switch.

For a CX-Series or FC4700-Series storage system, each SP is a host (**-h** switch) to which you address the command. The command can unbind only LUNs owned by the SP you specify with **-h**.

User Access

You must have a user entry in the Navisphere Agent configuration file. For a pre-FC4700 storage system, if configuration access control is enabled, you must issue the command from a trusted server (see *accesscontrol (FC4500 and FC5300)* on page 3-3).

Format

unbind is used with **navicli** (described on page 2-12) as follows:

unbind *lun* **[-o]**

where

lun

Specifies the LUN to deconfigure.

-o

Executes the command without prompting for confirmation.

Conventions and Recommendations

None

Examples

navicli -d c1t0d0s1 -h server1 unbind 3 -o ↵

This command destroys (deconfigures) LUN 3 without prompting you for permission, and frees its disks to be reconfigured.

Output

None

unitserialnumber

Displays or changes the VDPP80 (port 80) behavior mode

Description

The **unitserialnumber** command displays or set the VDPP80 behavior mode, which defines how subsequent VPDP80 requests will be populated with the storage 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 Chapter 3.

For a CX-Series or FC4700-Series storage system, each SP is a host (**-h** switch) to which you address the command.

User Access

You must have a user entry in the Navisphere Agent configuration file.

Format

unbind is used with **navicli** (described on page 2-12) as follows:

unitserialnumber [array | lun]

where

array

Sets the behavior mode to array (storage system).

lun

Sets the behavior mode to LUN.

Conventions and Recommendations

None

Examples

navicli -h ss1_spa unitserialnumber ↵

```
Current unit serial number mode is: LUN
```

navicli -h ss1_spa unitserialnumber array ↵

These two commands display the current behavior mode and then set the mode to **array** (storage-system) mode.

upload (pre-FC4700 only)

Copies Core Software dump data to a file

Description

Transfers to a disk file the dump data written by the Core Software when an SP encounters a serious error condition. You can then send the file to the factory for diagnosis of the problem.

The CLI will create the file if it does not exist. The pathname must be in a LUN accessible to the host Agent. This command replaces the CLARVOiiANT **upload** command.

User access

Anyone who can log in to the host running the Navisphere CLI. Write access to the destination directory is required.

Format

upload is used with **navicli** (described on page 2-12) as follows:

upload [-report] - pathname *pathname* **[-disk** *disk*]
-select a | b | ab | la | lb | lab

where

-pathname *pathname*

Specifies the full pathname of the file to which the CLI will copy the data.

-select a | b | ab | la | lb | lab

Specifies which diagnostic data to copy to the file. The values have the following meanings:

a - Copies SP A's Core Software dump
b - Copies SP B's Core Software dump
ab - Copies SP A and B's Core Software dump
la - Copies SP A's latest Core Software dump
lb - Copies SP B's latest Core Software dump
lab - Copies SP A and B's latest Core Software dump

The optional switches are

-report

Copies the state of mode page 39 hex (Upload information mode page) to the file. You must also use the CLI **-f** switch to write the report in the file. You cannot use **-report** with any other option.

-disk *disk*

Specifies the disk from which the CLI will copy the data. Cannot be used with **-select la** or **lb** options.

Conventions and recommendations

None.

Examples

navicli -d clt0d0s2 -h server1 -pathname c:\temp\csdump.txt upload -report ↵

This command copies the state of mode page 39 at the time of the last Core Software dump into file **csdump.txt** in directory **c:\temp**.

Output

If the version of Core Software running on the SP does not support this command, a `Not supported` error message is printed to **stderr**. Possible errors:

```
DIRECTORY _REQUIRED
F_OPTION_REQUIRED
INCOMPATIBLE ARGUMENTS
INVALID_SELECT_VALUES
```

3

Access Logix (Storage Group) Commands

This chapter describes the Access Logix™ (Storage Group) commands that are available for shared storage systems; that is, storage systems with the EMC Access Logix option.

The commands in this chapter function only with a storage system that has the optional Access Logix software installed.

Topics are

Shared Storage Setup and Management Overview

Storage Groups are meaningful only in shared environments where multiple hosts will have exclusive or shared access to LUNs in a storage system. You 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 Navisphere Manager 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 Chapter 2 for example use of the CLI.
3. For an FC4500 or FC5300 storage system in a SAN, enable configuration access control on one or more hosts. You can use Manager or the CLI command **accesscontrol**.
4. Create the Storage Groups you want using Manager or the CLI command **storagegroup -create.**
5. Connect the Storage Groups to hosts using Manager or the CLI. 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.
6. Assign LUNs to the Storage Groups using Manager 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.
7. For an FC4500 or FC5300, apply the Storage Group parameters to all hosts using the CLI **register** function.

   For an FC4500 or FC5300, optionally specify equal access time for each server using Manager or the CLI **fairness** function.
8. As needed, reconfigure host-Storage Group connections using Manager or the CLI command **storagegroup -sethost**. If you need to disconnect a host from a Storage Group, use **storagegroup -disconnecthost**.

accesscontrol (FC4500 and FC5300)

Enables password protection

Description

The **accesscontrol** command lets you add another level of system security by using a password to control access to all CLI **set** commands that can modify the storage-system configuration. The **get** commands are not affected. The default state is disabled.

For CX-Series or FC4700-Series storage systems, in which SPs are servers, this command has no meaning and it is not supported.

User Access

You must have a user entry in the Navisphere Agent configuration file, and if configuration access control is enabled, you must issue the command from a trusted server (see below).

Format

accesscontrol is used with **navicli** (described on Page 2-12) as follows:

accesscontrol [**-hbalist**] [**-loginserver** *servername*] [**-logoutserver** *servername*] [**-passwd**] [**-showhba** *uid*]

where

-hbalist

Displays information about each HBA in the Access Logix software database, including each HBA UID and whether the HBA is trusted.

-loginserver *servername*

Enables logging in every HBA on the specified server that is connected to the storage system. *servername* specifies the server. You will be prompted for the password whenever you execute this command. After you correctly enter the password, that server (*servername*) becomes trusted (has permission to execute CLI commands that change the storage-system configuration, for example, the **set c**ommands).

-logoutserver *servername*

Enables logging out every HBA on the specified server that is connected to the storage system. *servername* specifies the server. After you execute this command, that server (*servername*)

becomes untrusted (is denied permission to execute CLI commands that change the storage-system configuration, for example, the **set** commands).

-passwd

Enables setting or changing the password.

-showhba *uid*

Displays information about the specified HBA, including the HBA unique ID and whether the HBA is trusted. *uid* specifies the HBA unique ID number.

Conventions and Recommendations

None

Example

navicli -d c1t0d0s2 -h server1 accesscontrol -passwd ↵

Output

If the version of Core Software running on the SP does not support this command, an error message is printed to **stderr**. Otherwise, you will be prompted as follows:

If a password does not exist, this command sets the password.

```
Password:
Retype Password:
```

If a password exists, this command sets the password.

```
There is a password currently in use.
Would you like to create a new password: (y/n)?
```

If **n**, no changes occur. If **y**, you are prompted as follows.

```
Old Password:
New Password:
Retype New Password:
```

If you press Enter at the `New Password:` prompt and then enter another carriage return at the `Retype New Password:` prompt, the following prompt appears:

```
You have entered no password. This will allow full
configuration access to all arrays.
Allow all initiators to configure array? (y/n)
```

fairness (FC4500 and FC5300)

Enables or disables fairness

Description

The **fairness** command sets the state of the fairness function. If there are no parameters, the command returns the current status of fairness.

For CX-Series or FC4700-Series storage systems, in which SPs are servers, this command is not supported.

By default, the storage system processes I/O requests from servers on a first-come, first-served basis. With multiple servers contending for the use of a storage system, a server with disproportionate processing demands might monopolize storage-system resources. In addition, operating systems, such as Windows NT, use scheduling policies that slow down storage-system access within a storage area network (SAN). To provide each server on a SAN with a fair amount of storage-system resources, shared storage systems have an optional fairness algorithm. This algorithm tries to manage the I/Os accepted by the storage system so that servers accessing different LUNs with similar data access patterns will get similar I/O throughput. Some data access patterns, however, do not work well with the algorithm. We strongly recommend that you try using fair access, especially if Windows NT servers are accessing the storage system. Should I/O performance be unsatisfactory, you can turn off fair access, and return to the first-come, first-served algorithm.

User Access

You must have a user entry in the Navisphere Agent configuration file, and if configuration access control is enabled, you must issue the command from a trusted server (see *accesscontrol (FC4500 and FC5300)* on page 3-3).

Format

fairness is used with **navicli** (described on Page 2-12) as follows:

fairness [-on | -off]

where

-on

Enables fairness.

-off

Disables fairness (off is the default state).

Conventions and Recommendations None

Examples **navicli -d c1t0d0s1 -h server1 fairness ↵**

Displays the current state.

Output A message indicating the new status of fairness: On or Off.

port

List SP port information or removes an HBA entry from an SP's initiator list

Description

The **port** command lists SP port information or removes an HBA entry from an SP's permitted initiator list. For CX-Series or FC4700-Series storage systems, see also the **storagegroup -setpath** command starting on page 3-30 and **alpa** command, page 2-20.

User Access

You must have a user entry in the Navisphere Agent configuration file, and if configuration access control is enabled, you must issue the command from a trusted server (see *accesscontrol (FC4500 and FC5300)* on page 3-3).

Format

port is used with **navicli** (described on Page 2-12) as follows:

port [**-list** [*optional-list-switches*]] [**-removeHBA -hbauid** *hbauid*] [**-o**]

The optional **port -list** switches are

[**-all**] [**-arraycommpath**] [**-arrayhba**] [**-failovermode**] [**-hba**] [**-gname**] [**-sp**] [**-uid**] [**-unitserialnumber**]

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 below 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 **arraycompath** setting: 0 if **arraycompath** is disabled (it must be disabled for use with ATF); 1 if **arraycommpath** is enabled.

-arrayhba

Displays information about all storage systems attached to this HBA, or about storage systems that were logged in at some point and for which initiator records still exist. See Example 2 for a display.

-failovermode

Displays the failover mode: 0, 1, or 2. See the **storagegroup -failovermode** description for 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

Specifies HBA ports only.

-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.

-unitserialnumber

Specifies the **unitserialnumber** mode).

-removeHBA -hbauid *hbauid*

Removes an HBA port specified with **-hbauid**. *hbauid* specifies a unique host bus adapter identification number (must use uppercase). You can use the optional **-o** switch with **-removeHBA**.

-o

Indicates not to prompt for verification.

Conventions and Recommendations

None

Example 1 **navicli -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
    StorageGroup Name:      None


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 B
SP Port ID:          0
SP UID:
   50:06:01:60:D0:C3:0F:E0:50:06:01:68:50:C3:0F:E0
Link Status:         Up
Port Status:         Online
Switch Present:      YES
Switch UID:
   10:00:00:60:69:10:18:16:20:09:00:60:69:50:14:13
SP Source ID:        727296

SP Name:             SP B
SP Port ID:          1
SP UID:
   50:06:01:60:D0:C3:0F:E0:50:06:01:69:50:C3:0F:E0
Link Status:         Down
Port Status:         DISABLED
Switch Present:      YES
Switch UID:
   00:00:00:00:00:00:00:00:00:00:00:00:00:00:00:00
SP Source ID:        239

SP Name:             SP A
SP Port ID:          0
SP UID:
   50:06:01:60:D0:C3:0F:E0:50:06:01:60:50:C3:0F:E0
Link Status:         Up
Port Status:         Online
Switch Present:      YES
Switch UID:
   10:00:00:60:69:50:10:4A:20:09:00:60:69:50:15:23
SP Source ID:        661760

SP Name:             SP A
SP Port ID:          1
```

```
SP UID:
   50:06:01:60:D0:C3:0F:E0:50:06:01:61:50:C3:0F:E0
Link Status:          Down
Port Status:          DISABLED
Switch Present:       YES
Switch UID:
   00:00:00:00:00:00:00:00:00:00:00:00:00:00:00:00
SP Source ID:         239
```

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.

Example 2 **navicli -h ss1_spa port -list -all ↵**

```
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
    ArrayCommPath:          0
    Failover mode:          1


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
    ArrayCommPath:          0
    Failover mode:          0


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
    ArrayCommPath:          0
    Failover mode:          0

    SP Name:                SP A
    SP Port ID:             1
    HBA Devicename:
    Trusted:                NO
    Logged In:              NO
    Defined:                YES
    Initiator Type:            3
    StorageGroup Name:      Documentation
    ArrayCommPath:          0
    Failover mode:          0
```

```
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
    StorageGroup Name:     None
    ArrayCommPath:         0
    Failover mode:         0


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
    ArrayCommPath:         1
    Failover mode:         2
```

```
Information about each SPPORT:

SP Name:              SP B
SP Port ID:           0
SP UID:
   50:06:01:60:D0:C3:0F:E0:50:06:01:68:50:C3:0F:E0
Link Status:          Up
Port Status:          Online
Switch Present:       YES
Switch UID:
   10:00:00:60:69:10:18:16:20:09:00:60:69:50:14:13
SP Source ID:         727296

SP Name:              SP B
SP Port ID:           1
SP UID:
   50:06:01:60:D0:C3:0F:E0:50:06:01:69:50:C3:0F:E0
Link Status:          Down
Port Status:          DISABLED
Switch Present:       YES
Switch UID:
   00:00:00:00:00:00:00:00:00:00:00:00:00:00:00:00
SP Source ID:         239

SP Name:              SP A
SP Port ID:           0
SP UID:
   50:06:01:60:D0:C3:0F:E0:50:06:01:60:50:C3:0F:E0
Link Status:          Up
Port Status:          Online
Switch Present:       YES
Switch UID:
   10:00:00:60:69:50:10:4A:20:09:00:60:69:50:15:23
SP Source ID:         661760

SP Name:              SP A
SP Port ID:           1
SP UID:
   50:06:01:60:D0:C3:0F:E0:50:06:01:61:50:C3:0F:E0
Link Status:          Down
Port Status:          DISABLED
Switch Present:       YES
Switch UID:
   00:00:00:00:00:00:00:00:00:00:00:00:00:00:00:00
SP Source ID:         239
```

Output See the examples above.

register

Enables HBA(s) to be associated with a specified hostname

Description

The **register** command, when issued without parameters, instructs the specified host to associate its hostname with its HBA(s), and to broadcast that information to every Storage Group storage system attached to the server.

For any storage system type, you must specify the hostname of a server computer system, not the hostname of an SP.

User Access

You must have a user entry in the Navisphere Agent configuration file.

Format

register is used with **navicli** (described on Page 2-12) as follows:

register [-list]

where

-list

Displays information about the registered HBAs.

Conventions and Recommendations

None

Examples

For a CX-Series or FC4700-Series storage system:

navicli -h server1 register ↵

For a pre-FC4700 storage system:

navicli -d c1t0d0s1 -h server1 register ↵

Output

None

sc_off (FC4500 and FC5300)

Disables data access control

CAUTION

Be aware that executing sc_off resets the storage system to its factory unshared storage settings, permanently destroying all previously implemented shared storage features.

Description

The **sc_off** command disables data access control and turns off shared storage features. You can use this command to reset the storage system to its factory unshared storage settings.

User Access

You must have a user entry in the Navisphere Agent configuration file. For a storage system other than an CX-Series or FC4700-Series, if configuration access control is enabled, you must issue the command from a trusted server (see *accesscontrol (FC4500 and FC5300)* on page 3-3).

Format

sc_off is used with **navicli** (described on Page 2-12) as follows:

sc_off [-o]

-o

Executes the command without prompting for confirmation.

Conventions and Recommendations

None

Examples

navicli -d c1t0d0s2 -h server1 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 storage system.

The following functions will be performed, if necessary:

Clear the storage 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 storage 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 storage system.

The following functions will be performed, if necessary:

Clear the storage 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
```

storagegroup

Creates and configures storage groups

Description

The **storagegroup** command lets you create and manage shared storage systems; that is, storage systems that use Storage Groups and have the Access Logix 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 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.

User Access

You must have a user entry in the Navisphere Agent configuration file. For a storage system other than an CX-Series or FC4700-Series, if configuration access control is enabled, you must issue the command from a trusted server (see *accesscontrol (FC4500 and FC5300)* on page 3-3).

Format

storagegroup is used with **navicli** (described on Page 2-12) as follows:

storagegroup
[**-addhlu** *switches*] |
[**-addsnapshot** *switches*] |
[**-chgname** *switches*] |
[**-connecthost** *switches*] |
[**-create** *switch*] |
[**-destroy** *switch*] |
[**-disconnecthost** *switch*] |
[**-enable**] |
[**-ip** *host-ip-address*] |
[**-list** *switches*] |
[**-removehlu** *switches*] |
[**-removesnapshot** *switches*] |
[**-sethost** *switches*] |
[**-setpath** *switches*] |
[**-shareable** *switch*] |

[-unitserialnumber [array | lun]
[-o]

The switches are as follows.

storagegroup command, **-addhlu** switch
-addhlu -gname *StorageGroupName* | **-uid** *StorageGroupUID*
-hlu *hlunnumber* **-alu** *alunnumber*

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 on page 3-34.

-gname *StorageGroupName*

Specifies the name of the Storage Group.

-uid *StorageGroupUID*

Specifies the Storage Group unique identification number.

-hlu *hlunumber*

Specifies the host LUN number, which is the number that the storage-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 the actual storage 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.

For SGI IRIX servers, 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 storage system.

-alu *alunumber*

Specifies the storage system LUN number, the actual LUN number internal to the storage system. This is the number assigned when the LUN was bound. *alunumber* specifies the logical unit number (valid range is 0 through 222). This switch is required along with **-hlu** and either the **-gname** or **-uid** switch.

storagegroup command, **-addsnapshot** switch
-addsnapshot **-gname** *StorageGroupName* | **-uid** *StorageGroupUID* **-snapshotname** *snapshotname* | **-snapshotuid** *snapshotuid* | **-snapshot** *lunUID*

-addsnapshot (CX-Series or FC4700-Series only) adds a SnapView 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.

-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.

-snapshot *lunUID*

Specifies the snapshot Unique ID number (World Wide Name, WWN). This switch is retained from earlier revisions to maintain compatibility. We recommend that you use **-snapshotname** or -**snapshotwwn** instead. This switch (or one of the recommended ones) is required along with the **-gname** or **-uid** switch.

storagegroup command, **-chgname** switch
-chgname -gname *StorageGroupName* | **-uid** *StorageGroupUID*
-newgname *NewName*

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.

-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.

storagegroup command**, -connecthost s**witch
-connecthost -host *HostName*
-gname *StorageGroupName* | **-uid** *StorageGroupUID*

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 s**toragegroup -setpath**.

You may use the **navicli accesscontrol -hbalist** 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 on page 3-34.

-host *HostName*

Specifies the user-defined host name.

-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 on page 3-34.

-gname *StorageGroupName*

StorageGroupName specifies a user-defined Storage Group name.

storagegroup command, **-destroy** switch
-destroy -gname *StorageGroupName* | **-uid** *StorageGroupUID*

Destroys the specified Storage Group. 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 unique identification number.

storagegroup command, **-disconnecthost** switch
-disconnecthost -host *HostName*

Disconnects all of the specified host's HBA/SP combinations from the currently connected Storage Group, and reconnects them to the default Storage Group. 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 host name.

-enable

Enables data access control. Sets the default Storage Group to the management Storage Group.

storagegroup command, **-list** switch
-list [**-gname** *StorageGroupName* | **-uid** *StorageGroupUID*]

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.

-uid *StorageGroupUID*

Specifies the Storage Group unique ID.

storagegroup command, **-o** switch
-o

Executes the command without prompting for confirmation.

storagegroup command, **-removehlu** switch
-removehlu -gname *StorageGroupName* | **-uid** *StorageGroupUID*
-hlu *hlunnumber*

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 unique ID.

-hlu *hlunumber*

hlunumber specifies the logical unit number, which is the number that the storage-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* | **-snapshot** *lunUID*

-removesnapshot (CX-Series or FC4700-Series only) removes a SnapView 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 unique ID number (World Wide Name, WWN). One of these switches is required.

-snapshot *snapshotUID*

Specifies the snapshot Unique ID number (World Wide Name, WWN). This switch is retained from earlier revisions to maintain compatibility. We recommend that you use **-snapshotname** or -**snapshotwwn** instead.

storagegroup command, **-sethost** switch

storagegroup command
-sethost -hostname *host* | **-ip** *host-ip-address*
| **-arraycommpath 0**|**1**] | **-failovermode 0**|**1**|**2**] |
[**-type** *initiator-type*] [**-unitserialnumber array**|**lun**]

The **-sethost** function creates or changes certain settings for all initiators (HBAs) in the specified host that are connected to a specific storage 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.

-arraycommpath [0 | 1]

storagegroup -setpath with **-arraycommpath** creates or removes a communication path between the server and storage system. Generally this function is needed when you want to configure a storage system that has no LUNs bound. The setting should be 0 for ATF.

Changing the **arraycommpath** setting may force the storage system to reboot. The CLI will issue a confirmation request that indicates whether a storage-system reboot is required. However, the CLI will not issue a confirmation request first 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 storage system, or unshared storage, use the command **arraycommpath**.

storagegroup command, **-sethost** switch continued

To discover the current setting of **arraycommpath**, use the **storagegroup port -list -all** command.

0

Disables the communication path previously enabled.

1

Enables a communication path.

Example with arraycommpath:
navicli -h ss1_spa storagegroup -sethost -hostname server101 -arraycommpath 1 ↵

storagegroup command, **-sethost** switch continued
-failovermode 0 | 1 | 2

storagegroup -sethost with **-failovermode** sets the type of trespass needed for failover software. Use this command with certain types of failover software if suggested in the failover software Release Notice or manual. The **failovermode** setting should be 0 for ATF.

Changing the **failovermode** setting may force the storage system to reboot. The CLI will issue a confirmation request that indicates whether a storage-system reboot is required. However, the CLI will not issue a confirmation request first 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 shared storage systems (use Access Logix, and connect via switch) only. For unshared storage, use the command **failovermode**.

storagegroup command, **-sethost** switch continued

To discover the current setting of **failovermode**, use the **storagegroup port -list** command.

-0
Failover mode 0.

-1
Failover mode 1.

- 2
Failover mode 2.

Example with failovermode:
navicli -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 (next).

-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 hostname.

-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

0x2 HP (auto trespass)
0x3 CLARiiON Open (default).
0x9 SGI
0xa HP (no auto trespass)
0x13 Dell
0x16 Fujitsu]
0x1c Compaq Tru64

storagegroup command, **-sethost** switch continued
-unitserialnumber [**array** | **lun**]

The **unitserialnumber** command displays or sets the VDPP80 behavior mode, which defines how subsequent VPDP80 requests will be populated with the storage system serial number. You might need to do this for software such as SunCluster 3. You can discover the mode with the **storagegroup port -list** command. To set this mode for a host, see **storagegroup -sethost** above.

array
Sets the behavior mode to storage system.

lun
Sets the behavior mode to LUN.

Example with **unitseriaknumber**:
navicli -h ss1_spa storagegroup -sethost -unitserialnumber lun ↵

storagegroup command, **-setpath** switch
-setpath -gname *StorageGroupName* | **-uid** *StorageGroupUID* |
[**-arraycommpath 0** | **1**]] **-failovermode 0** | **1** | **2**] |
-hbauid *hbauid* [**-hostname** [*host*] [**-ip** *ip-address*]
sp a | **b -spport 0** | **1**

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.

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

storagegroup -setpath with **-arraycommpath** creates or removes a communication path between the server and storage system. Generally this function is needed when you want to configure a storage system that has no LUNs bound. The setting should be 0 for ATF.

storagegroup command, **-setpath** switch continued

Changing the **arraypath** setting forces the storage system to reboot. It will ask for confirmation first unless you include the **-o** switch.

This form of **-arraycommpath** works for shared storage systems (uses Access Logix, and connects via switch) only. For unshared storage, use the command **arraycommpath**.

To discover the current setting of **arraycommpath**, use the **storagegroup port -list** command.

0
Disables the communication path previously enabled. Use this with ATF.

1
Enables a communication path. Do not use with ATF.

-o
Executes command without prompting for confirmation.

Example with arraycommpath:
navicli -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 -arraycompath 1 ↵

-failovermode 0|1|2 [-o]

storagegroup -setpath with **-failovermode** sets the type of trespass needed for failover software.Use this command with certain types of failover software if suggested in the failover software Release Notice or manual.

Changing the **failovermode** setting may force the storage system to reboot. The CLI will issue a confirmation request that indicates whether a storage-system reboot is required. However, the CLI will not issue a confirmation request first if you include the **-o** switch.

This form of **-failovermode** works for one Storage Group. To set the entire storage system mode, use the command **failovermode**.

storagegroup command, **-setpath** switch continued

To discover the current setting of **failovermode**, use the **storagegroup port -list** command.

0
Failover mode 0

1
Failover mode 1.

2
Failover mode 2.

-o
Executes the command without prompting for confirmation.

Example with failover mode:
navicli -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.

-hostname [*host*]

Specifies the HBA owner's hostname. The storage system will use the hostname (or **ip** address, below) for any subsequent **storagegroup -connecthost** and **-disconnecthost** commands you issue. If you omit this, the storage system uses the HBAUID. Not required.

-ip *ip-address*

Specifies the HBA owner's IP address (that is, the server's IP address. Not required. See **-hostname** above.

storagegroup command, **-setpath** switch continued

-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.

storagegroup command, -**sharable** 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** indicate whether the Storage Group can be shared. Only Navisphere Manager can enforce sharing.

-gname *StorageGroupName* **yes | no**

Sets the Storage Group named *StorageGroupName* to be sharable (**yes**) or not sharable (**no**).

-uid *StorageGroupUID* **yes | no**

Sets the Storage Group with unique ID *StorageGroupUID* to be sharable (**yes**) or not sharable (**no**).

storagegroup command, **-type** switch
-type *initiatortype*

Specifies an initiator type to override the system default. The CLI uses the default, **3**, for the target if omitted.You can discover the system type with the **storagegroup port -list** command. Initiator type values (specify **0x** to indicate hex) are

0x2	HP (auto trespass)
0x3	CLARiiON Open (default).
0x9	SGI
0xa	HP (no auto trespass)
0x13	Dell
0x16	Fujitsu
0x1c	Compaq/Tru64

storagegroup command, **-unitserialnumber** switch
-unitserialnumber [array | lun]

The **unitserialnumber** command displays or sets the VDPP80 behavior mode, which defines how subsequent VPDP80 requests will be populated with the storage system serial number. You might need to do this for software such as SunCluster 3. You can discover the mode with the **storagegroup port -list** command. To set this mode for a host, see **storagegroup -sethost** above. To set it for an entire storage system, see the **unitserialnumber storagegroup** command in Chapter 2.

array
Sets the behavior mode to storage system.

lun
Sets the behavior mode to LUN.

Example with **unitseriaknumber**:
navicli -h ss1_spa storagegroup -unitserialnumber lun ↵

Conventions and Recommendations

None

Examples

In the following example, Navisphere connects all of **server2**'s HBA-SP combinations to the Storage Group **mail**.

navicli storagegroup -connecthost -o -h server2 -gname mail ↵

In the next, the **-list** command displays Storage Group information.

navicli -h ss1_spa storagegroup -list ↵

```
Storage Group Name:    StorageGroup1
Storage Group UID:
   60:06:01:63:40:19:60:00:32:E8:F0:9A:AC:4F:2A:32
HBA/SP Pairs:
  HBA UID                                                SPPort
  -------                                                ------
  10:00:00:00:C9:20:DE:0C:10:00:00:00:C9:20:DE:0C     0
  10:00:00:00:C9:20:DE:0C:10:00:00:00:C9:20:DE:1B     1
  10:00:00:00:C9:20:DE:45:10:00:00:00:C9:20:DE:16     0
  10:00:00:00:C9:20:DE:45:10:00:00:00:C9:20:DE:45     1
Special:               YES
Default:               YES
Shareable:             YES
```

The Special Storage Group property appears only for special Storage Groups; the Default Storage Group property appears only for default Storage Groups.

The following example creates two Storage Groups, connects them to separate hosts, and adds a LUN to each one.

navicli -h ss_spa storagegroup -create -gname Production ↵
navicli -h ss_spa storagegroup -create -gname Backup ↵

navicli -h ss_spa storagegroup -connecthost -o -host ServerABC -gname Production ↵

navicli -h ss_spa storagegroup -connecthost -o -host ServerXYZ -gname Backup ↵

navicli -h ss_spa storagegroup -addhlu -gname Production -hlu 20 -alu 20 ↵

navicli -h ss_spa storagegroup -addhlu -gname Backup -hlu 21 -alu 21 ↵

Output See the first example above.

A

CLI Error Codes

This appendix lists the basic and storage group error codes returned by the CLI. It also includes SnapView and MirrorView error codes, although these applications themselves are explained in other manuals. The numbers proceed sequentially.

Major topics are

Basic Command Error Codes

Error Value	Description
0	No error.
1	Invalid command line parameters.
2	Too few parameters.
3	Too many parameters.
4	Invalid bind type.
5	Invalid LUN number.
6	Invalid rebuild time.
7	Disk names for groups of RAID type 1/0 must have an even number of arguments.
8	Invalid number of disks in **bind** command.
9	Invalid disk name specified.
10	An enclosure containing one or more of the disks is not present.
11	Disk already bound or binding.
12	Disk is empty or missing.
13	Invalid stripe size.
14	Disk name not unique; all names in disk-name must be unique.I
15	Invalid cache flags.
16	Invalid default owner.
17	Incorrect number of **chglun** parameters.
18	Unable to determine name of target host machine.
19	Enable/disable flag invalid.
20	Invalid usable cache size.
21	Invalid page size.
22	Invalid watermark value.
23	High watermark less than low watermark.

Error Value	Description
24	No device name listed on command line.
25	Invalid idle threshold.
26	Invalid idle delay.
27	Invalid write aside size.
28	Disks must be on separate buses for bind.
29	The Agent was unable to configure any devices.
30	LUN does not exist.
31	LUN already exists.
32	Cannot get current working directory for firmware command.
33	Illegal position for hot spare.
34	Invalid read cache value.
35	Invalid read cache size.
36	Invalid write cache value.
37	Invalid write cache size.
38	Invalid RAID 3 cache size.
39	Cannot access device.
40	Switch not supported.
41	Command is not supported.
42	Unknown error.
50	Agent - Memory allocation error.
51	Agent - Invalid device name.
52	Agent - Host connection not found.
53	Agent - SP not found.
54	Agent - Invalid SP suffix.
55	Agent - Invalid LUN number.
56	Agent - Invalid page size.

Error Value	Description
57	Agent - Invalid command line switch.
58	Agent - Error **bind** command.
59	Agent - Error **chglun** command.
60	Agent - Error **unbind** command.
61	Agent - Error **firmware** command.
62	Agent - Error **trespass** command
63	Agent - Error **rebootSP** command.
64	Agent - Generic error.
65	Agent - Unknown error.
66	Error returned from Agent.
67	RAID3 does not support write caching
68	RAID Group - Invalid RAID Group ID.
69	RAID Group - Valid values for trespass option are a and b.
70	RAID Group - Valid values for priority option are ASAP, High, Medium, and Low.
71	RAID Group - Valid values for lex option are yes and no.
72	RAID Group - RAID Group not found.
73	RAID Group - RAID Group not supported on this system.
74	RAID Group - Valid values for rm option are yes and no.
75	RAID Group - Valid values for sq option are mb, gb, sc, and bc.
76	RAID Group - Valid values for pl option are bf, ff.
77	RAID Group - Valid values for sp option are a and b.
78	RAID Group - Specific Disk download not supported.
79	RAID Group - This RAID Group has LUNS in it. Unbind them and run removerg again.
80	Zerodisk command failed
81	Zeroing not supported

Storage Group Command Error Codes

Error Value	Description
82	This version of the Core 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 Core 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 Base 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.
98	Cannot perform inquiry.
99	Cannot read block data.
100	Cannot write to file.
101	Cannot open pipe.

Error Value	Description
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.
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, MirrorView, and Other CX-Series or FC4700-Series-Only Command Error Codes

Error Value	Description
123	Snapshot does not exist.
124	This version of Base Software does not support SnapView.
125	Invalid SP name.
126	Cache (snapshot) does not exist.
127	Package number invalid
128	This version of Base Software does not support nondisruptive software installation (NDU).
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.

Error Value	Description
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 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 “-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.
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.

Error Value	Description
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 is not shareable.
181	Invalid HLU number.
182	Invalid ALU number.
183	Invalid port ID.
184	Remote server can not be managed.
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 of message or file can be specified.
194	Valid dial string only contains digits, parentheses, hyphen.
195	File does not exist or can't open..
196	Specified user already exists..

Error Value	Description
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	Can't specify both snapshot name and snapshot ID.
206	Can't specify both -mode and -simulation.
207	This command is not supported on remote host.
208	Switch -pathname must be specified.
209	Get local server attributes failed.
210	This version of Base/Core 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.
213	Cannot add LUN to snapshot cache; the maximum number of cache LUNs has been allocated.
214	Cannot add LUN to snapshot cache; the maximum number of cache 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 cache LUNs in the specified SP's cache.

Error Value	Description
222	This LUN cannot be added to the Storage Group since it is participating in aremote mirror.
223	Allocate log need specify LUN with valid owner.
224	This request has been issued through the SP that is not the current owner of the targeted LUN.

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