EMC Navisphere
Command Line Interface (CLI)

REFERENCE
For Basic, Access Logix, MetaLUN, Reserved LUN Pool, iSCSI, LUN Migration, Domain and Security Commands

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

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

Audience

This guide is part of the Navisphere® documentation set, and is intended for use by those who will use CLI commands to configure, manage, or obtain the status of EMC® CLARiiON® disk-array storage systems.

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

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

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

Organization

This manual contains nine chapters, as follows.

Chapter 1 Introduces Navisphere and the CLI.
Chapter 2 Introduces naviseccli, navicli and navicli.jar commands.
Chapter 3 Explains the basic CLI commands; that is, those that are not specifically designed to manage optional features.
Chapter 4 Explains the Storage Group CLI commands for managing Access Logix™.
Chapter 5 Explains the LUN expansion (metaLUN) CLI commands.
Chapter 6 Explains how to configure the reserved LUN pool and describes the CLI commands that you can use if SnapView is installed on your system.
Chapter 7 Explains the iSCSI commands.
Chapter 8 Explains the LUN migration commands.
Chapter 9 Explains the Domain and Security commands.
Appendix A Lists the error codes you might receive from CLI commands.
Appendix B Lists the commands not supported by Secure CLI.

Related Documentation

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

Related documents include

EMC Navisphere Manager Administrator’s Guide (P/N 069001125)
EMC MirrorView Command Line Interface (CLI) Reference (P/N 069001184)
EMC MirrorView/Asynchronous Command Line Interface (CLI) Reference (P/N 300-001-335)
EMC SAN Copy Command Line Interface (CLI) Administrator’s Guide (P/N 069001189)
EMC SnapView admsnap and Command Line Interface (CLI) Administrator's Guide (P/N 069001181)

Conventions Used in This Guide

EMC uses the following conventions for notes, cautions, warnings, and danger notices.

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

CAUTION

A caution contains information essential to avoid data loss or damage to the system or equipment. The caution may apply to hardware or software.

Typographical Conventions

This manual uses the following format conventions:

This typeface Indicates text (including punctuation) that you type verbatim, all commands, pathnames, filenames, and directory names. It indicates the name of a dialog box, field in a dialog box, menu, menu option, or button.

This typeface Represents variables for which you supply the values; for example, the name of a directory or file, your username or password, and explicit arguments to commands.

This typeface Represents a system response (such as a message or prompt), a file or program listing.

[] Encloses optional entries.

| Separates alternative parameter values; for example: LUN-name | LUN-number means you can use either the LUN-name or the LUN-number.

Finding Current Information

The most up-to-date information about the EMC Navisphere CLI is posted on the EMC Powerlink website. We recommend that you download the latest information before you run the CLI commands.

To access EMC Powerlink, use the following link:

http://Powerlink.EMC.com
After you log in, select **Support > Document Library** and find the following:

- *Navisphere Host Agent/CLI and Utilities Release Notes* (P/N 085090643)
- The latest version of this manual that is applicable to your software revision
- *EMC Installation Roadmap for CX-Series, AX-Series, and FC-Series Storage Systems*, which provides a checklist of the tasks that you must complete to install your storage system in a storage area network (SAN) or direct connect configuration.

**Where to Get Help**

For questions about technical support, call your local sales office or service provider.

If you have a valid EMC service contract, contact EMC Customer Service at:

- **United States**: (800) 782-4362 (SVC-4EMC)
- **Canada**: (800) 543-4782 (543-4SVC)
- **Worldwide**: (508) 497-7901

Follow the voice menu prompts to open a service call and select the applicable product support.

**Sales and Customer Service Contacts**

For the list of EMC sales locations, please access the EMC home page at:

http://www.EMC.com/contact/

For additional information on the EMC products and services available to customers and partners, refer to the EMC Powerlink Web site at:

http://Powerlink.EMC.com

**Your Comments**

Your suggestions will help us continue to improve the accuracy, organization, and overall quality of the user publications. Please send a message to techpub_comments@EMC.com with your opinions of this guide.
This chapter describes the EMC® Navisphere® storage-system management configurations and architecture. Major topics are

- Terminology ........................................................................................................... 1-2
- About EMC Navisphere Software ..................................................................... 1-5
- Storage-System Configuration and Management with the CLI 1-14
- AX-Series Support .............................................................................................. 1-16

EMC 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

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<th>Meaning</th>
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<tr>
<td>Access Logix™ software</td>
<td>See shared storage system.</td>
</tr>
<tr>
<td>Agent</td>
<td>EMC Navisphere® Agent that runs on a server; see also Host Agent.</td>
</tr>
<tr>
<td>ATF Software</td>
<td>EMC Navisphere Application Transparent Failover software.</td>
</tr>
<tr>
<td>AX-Series storage system</td>
<td>AX150SC, AX100SC, AX150SCI, AX100SCI, AX150, AX100, AX150i and AX100i storage systems, where AX150SC, AX100SC, AX150SCI, and AX100SCI are single-SP storage systems; AX150, AX100, AX150i and AX100i are dual-SP storage systems; AX150, AX100, AX150SC and AX100SC are Fibre Channel storage systems; AX150SCI, AX100SCI, AX150i, and AX100i are iSCSI storage systems.</td>
</tr>
<tr>
<td>C-series storage system</td>
<td>C1000, C1900, C2x00, or C3000 series storage system.</td>
</tr>
<tr>
<td>CX-Series or FC4700-Series storage system</td>
<td>CX-Series and FC4700-Series storage systems only.</td>
</tr>
<tr>
<td>CDE</td>
<td>EMC CLARiiON® Driver Extensions failover software.</td>
</tr>
<tr>
<td>CHAP</td>
<td>Challenge Handshake Authentication Protocol is an authentication mechanism used by iSCSI targets to authenticate initiators or by iSCSI initiators to authenticate targets (mutual CHAP).</td>
</tr>
<tr>
<td>CLI</td>
<td>EMC Navisphere Command Line Interface.</td>
</tr>
<tr>
<td>domain</td>
<td>In the context of Navisphere software, a group of storage systems that you can manage from a single management application session. You can divide your storage systems into multiple domains as long as each storage system is in only one domain. Each domain has a directory that defines the storage systems in the domain.</td>
</tr>
<tr>
<td>EMC Navisphere Manager</td>
<td>The EMC Navisphere Manager application.</td>
</tr>
<tr>
<td>Event Monitor</td>
<td>EMC Navisphere Event Monitor.</td>
</tr>
<tr>
<td>FC-Series storage system</td>
<td>An FC4700, FC4700-2, FC4500, FC5600/5700, FC5200/5300, or FC5000 series Fibre Channel storage system.</td>
</tr>
<tr>
<td>FC4700-Series and later storage systems</td>
<td>FC4700-Series, CX-Series, and AX-Series storage systems only.</td>
</tr>
<tr>
<td>FLARE™ software</td>
<td>Formerly known as Core or Base software.</td>
</tr>
<tr>
<td>IQN</td>
<td>iSCSI Qualified Name is an iSCSI port worldwide name such as iqn.1992-04.com.emc:cx.apm0034901792.a0.</td>
</tr>
<tr>
<td>JBOD storage system</td>
<td>Storage system without storage processors (SPs); that is, one that contains only DAES and no DPEs.</td>
</tr>
<tr>
<td>Term</td>
<td>Meaning</td>
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<tr>
<td>HBA</td>
<td>Host bus adapter.</td>
</tr>
<tr>
<td>Host Agent</td>
<td>The EMC Navisphere Agent that runs on a storage-system server.</td>
</tr>
<tr>
<td>iSCSI</td>
<td>internet SCSI protocol that uses the Internet Protocol (IP) for communication between iSCSI initiators and iSCSI targets.</td>
</tr>
<tr>
<td>iSCSI initiator</td>
<td>An iSCSI device that initiates requests to iSCSI targets, such as a server that contains either NICs or iSCSI HBAs.</td>
</tr>
<tr>
<td>iSCSI target</td>
<td>An iSCSI device that responds to requests issued by initiators. For example, an iSCSI storage system is a target to iSCSI initiators.</td>
</tr>
<tr>
<td>managed Agent</td>
<td>Host Agent or SP Agent managed by EMC Navisphere management software.</td>
</tr>
<tr>
<td>managed host</td>
<td>A Host Agent that you selected to manage.</td>
</tr>
<tr>
<td>managed storage system</td>
<td>A storage system managed by EMC Navisphere Manager.</td>
</tr>
<tr>
<td>Manager</td>
<td>See <a href="#">EMC Navisphere Manager</a>.</td>
</tr>
<tr>
<td>NAS</td>
<td>Network attached storage.</td>
</tr>
<tr>
<td>non-RAID Group storage system</td>
<td>A storage system whose SPs are running FLARE (formerly called Base and Core) software without RAID Group functionality.</td>
</tr>
<tr>
<td>Pre-FC4700-series storage system</td>
<td>Class of storage system whose SPs do not have a network management connection: FC4500, FC5300, FC5500, FC5700, or C-Series storage systems.</td>
</tr>
<tr>
<td>Portal</td>
<td>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.</td>
</tr>
<tr>
<td>PowerPath</td>
<td>EMC PowerPath® failover software.</td>
</tr>
<tr>
<td>RAID Group storage system</td>
<td>A storage system whose SPs are running FLARE software with RAID Group functionality.</td>
</tr>
<tr>
<td>SAN</td>
<td>Storage area network.</td>
</tr>
<tr>
<td>secret</td>
<td>A password used for CHAP authentication in an iSCSI environment.</td>
</tr>
<tr>
<td>server or managed server</td>
<td>A host with a managed storage system.</td>
</tr>
<tr>
<td>shared storage system</td>
<td>A storage system with the EMC Access Logix™ option, which provides data access control (Storage Groups) and configuration access control. A shared storage system is always a RAID Group storage system.</td>
</tr>
<tr>
<td>Term</td>
<td>Meaning</td>
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<tr>
<td>Single-SP system</td>
<td>A storage system that has one SP. See <strong>AX-Series storage system</strong>.</td>
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<tr>
<td>SP</td>
<td>Storage processor.</td>
</tr>
<tr>
<td>SP Agent</td>
<td>The Navisphere Agent that runs on an SP (CX-Series and FC-Series storage systems).</td>
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<tr>
<td>Storage Group</td>
<td>A collection of one or more LUNs that you select, and to which you can connect one or more servers.</td>
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<tr>
<td>Storage Management Server software</td>
<td>Software that runs in a storage system or portal server and lets a person manage it over a network.</td>
</tr>
<tr>
<td>unshared storage system</td>
<td>A storage system without the EMC Access Logix option.</td>
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About EMC Navisphere Software

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

- Navisphere Storage System Initialization Utility
- Navisphere Host and SP Agents
- Navisphere Server Utility
- Navisphere Manager
- Navisphere Integrator
- Navisphere Storage Management Server
- Navisphere CLI
- Navisphere Analyzer

Navisphere Storage System Initialization Utility

The Navisphere Storage System Initialization Utility is supported for both AX-Series and CX-Series storage systems. You must initialize the storage system in order to register the server HBAs with the storage system and have access to the storage system's data.

For CX-Series storage systems, use the utility to discover storage systems, and set network parameters (IP address, subnet mask and default gateway). An authorized service provider must install and run the Initialization Utility.

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

Important The Navisphere Initialization Utility is supported only on the CX300, CX500, CX700, and AX-Series storage systems. CX-Series and AX100-Series systems must be running FLARE OE 02.16.xxx.5.yyy or higher. AX150-Series systems must be running FLARE 02.20.xxx.5.yyy or higher.
About EMC Navisphere CLI

---

**Navisphere Host and SP Agents**

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

Host Agents reside on attached hosts. SP Agents reside on the storage processors (SPs) of the most current storage systems (such as the CX-Series, FC-Series, and AX-Series), and are installed at the factory.

---

**Navisphere Server Utility**

Similar to the Host Agent, the Navisphere Server Utility registers the server’s HBA (host bus adapter) with the attached AX-Series or CX-Series storage system; however, unlike the Host Agent, the Server Utility does not

- send LUN mapping information back to a CX-Series storage system. This information will not display in the Manager UI or CLI. To see LUN mapping information in the Manager UI or CLI for a CX-Series storage system, you must use the Host Agent instead of the Server Utility.

LUN mapping information is sent to AX-Series storage systems. In Navisphere Manager, this information displays in the Manager UI or with the CLI `-lunmapinfo` command. In Navisphere Express, this information displays in the Manage Virtual Disks page.

- automatically retrieve information from storage systems, and forward it to Navisphere Manager or Navisphere Express. With the Server Utility, you must manually update the information by starting the utility or you can create a script to run the utility.

For Windows servers running version 6.20 or higher, you can automatically update server information if the Registration Service feature remains enabled after installing the Server Utility.

- require network connectivity to the storage system.
require that you install the utility; you can run it from the CD. However, we recommend that you install it on the server. Some features are not available unless you install the Server Utility on the server.

However, with the Server Utility you can perform the following functions:

- Windows servers with Microsoft iSCSI initiators can use the utility to configure iSCSI connections - log on, log off, and remove an iSCSI target - and to configure mutual CHAP.
- AX-Series storage systems running Navisphere Express can use the utility to manage snapshots. If you are managing your AX-Series storage system with Navisphere Manager or if you have a CX-Series storage system, you must use SnapView and the admsnap utility to manage snapshots.

**Important** The Server Utility is supported on the AX-Series and CX-Series storage systems. CX-Series and AX100-Series systems must be running FLARE OE 02.16.xxx.5.yyy or higher. AX150-Series systems must be running FLARE 02.20.xxx.5.yyy or higher.

Not all features are supported in all revisions of the Server Utility. Refer to the Server Utility’s online help for information on which features are available. You cannot install the Host Agent and the Navisphere Server Utility on the same server. However, you can install them on different servers that are connected to the same storage system.

---

**Navisphere Manager**

Manager is a centralized storage-system management tool for configuring and managing CLARiiON storage systems. It provides the following basic functionality:

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

Manager 6.X is a web-based user interface that lets you securely manage CLARiiON storage systems locally on the same LAN or remotely over the Internet, using a common browser. Manager 6.X resides on a CX-Series, FC-Series or AX-Series storage system or a Windows Server™ 2003, Windows® 2000, or Windows NT® server that is running the Storage Management Server software, and is
downloaded to the browser when the Storage Management Server software is accessed.

For an AX-Series storage system, you must complete an upgrade from Navisphere Express to Navisphere Manager. Reference the document for upgrading a storage system to Navisphere Manager and the *EMC Navisphere Manager Administrator’s Guide*.

### Navisphere Integrator

Integrator allows Navisphere managed storage systems to be discovered and monitored through the leading enterprise management platforms (EMP). Integrator also enables the launch of Manager from the EMP. Integrator supports the following EMPs:
- HP OpenView® management software
- Tivoli NetView® management software
- CA Unicenter™ TNG Framework

Navisphere Integrator is installed and executed on a Windows 2000 or Windows NT server that also hosts the EMP.

### Navisphere Storage Management Server

The Storage Management Server software is provided with Manager 6.X, and is installed and executed on each SP in a CX-Series, FC-Series or AX-Series storage system, or a Windows Server 2003, Windows 2000, or Windows NT server. A storage system with this software installed is a storage management server. A server with this software installed is called a server portal. All CX-Series (excluding the CX200 and CX300), AX-Series, and currently shipping FC4700-Series storage systems leave the factory with the Storage Management Server software installed on the SPs.

The CX200 and CX300 ship with the Storage Management Server Base software installed on the SPs.

The Storage Management Server software performs the following functions:
- Receives and responds to requests from Navisphere Manager 6.X
- Forwards requests to the local SP Agents for processing
About EMC Navisphere Software

About EMC Navisphere CLI

◆ Forwards status and configuration updates to Navisphere Manager 6.X
◆ Replicates user and domain information to all storage systems in domain
◆ Authenticates user logins and authorizes user requests
◆ Logs all user logins and actions

A system with Storage Management Server software installed can also act as a portal for managing storage systems that do not have the Storage Management Server software installed (such as FC5300 and FC4500 storage systems). As a portal, the system forwards requests to the SP or Host Agent that is managing the storage system, and also collects information from the SP or Host Agent and relays that information to Manager 6.X for display updates.

Navisphere CLI

The CLI complements or can be used as an alternative to Manager. It provides a command line interface for storage-system management, including storage provisioning, status and configuration information retrieval, and control. You can use the CLI to automate management functions through shell scripts and batch files. CLI commands for many functions are server-based and are provided with the Host Agent. The remaining CLI commands are web-based and are provided with software that runs in the storage-system SPs.

Navisphere CLI includes the Secure (on supported operating systems), Classic, and Java CLI functionalities. See Chapter 2, About CLI Commands.

The Navisphere CLI is supported on CX-Series, FC-Series, and AX-Series storage systems.

For an AX-Series system, you must install the Navisphere Manager Enabler in order for Navisphere CLI to be operational. Reference the document for upgrading a storage system to Navisphere Manager. Once you install the Navisphere Manager Enabler, Navisphere Express is no longer operational. You cannot uninstall the Navisphere Manager Enabler once you install it. You cannot use Navisphere Express and Navisphere CLI to co-manage an AX-series storage system.
The architecture of the Navisphere version 6.X Manager and CLI differ as follows:

- Manager 6.X is a web-based product that communicates with software called the Storage Management Server software that runs on SPs or Windows servers. The SPs and servers are grouped in entities called storage domains. When you log in to a storage system or server within the domain, Navisphere Manager provides a domain-based view in which you can manage your storage systems.

- Navisphere CLI 6.X is a command line interface that has some commands that are server-based and some that are web-based. Server-based commands communicate with the Host Agent. Web-based commands communicate with Storage Management Server software. In the CLI, you issue commands to individual storage systems through a command line structure.

The tradeoffs between Manager and the CLI are as follows:

<table>
<thead>
<tr>
<th>Manager</th>
<th>CLI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Uses a user interface (UI) with online, context-sensitive help</td>
<td>Uses a command line interface with a single help file through which you find the topic you want</td>
</tr>
<tr>
<td>Requires user interaction</td>
<td>Uses command lines that you can type interactively or write into a shell script for automated operations</td>
</tr>
</tbody>
</table>

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.

If you are running a VMware® ESX Server™, you can run Navisphere CLI from an ESX Server console or a virtual machine (VM). If you run Navisphere CLI from an ESX Server console, all commands are available. If you run Navisphere CLI from a VM, commands that require the Navisphere Host Agent are not supported, since the Navisphere Host Agent is not supported on a VM. The following commands require the Navisphere Host Agent: getatf, getagent, lunmapinfo, register, remoteconfig.
Navisphere Analyzer

Analyzer 6.X is a web-based tool, using a common browser, that allows an administrator to graphically examine the performance characteristics of the logical and physical entities that make up a CLARiiON storage system. Analyzer supports immediate (real-time) data display, as well as the display of previously logged data. As a result, Analyzer lets you do immediate comparisons, long-term trend analysis, and off-site performance troubleshooting/analysis.

Analyzer 6.X requires that Navisphere Manager 6.X be installed. Like Manager, Analyzer resides on a CX-Series or FC-Series storage system or a Windows NT® or Windows® 2000 server that is running the Storage Management Server software, and is downloaded to the browser when the Storage Management Server software is accessed.

Navisphere Environments

You start Manager 6.X in a supported browser on a Windows or UNIX® host by entering the IP address of an SP in the storage system with Manager installed on it. The Manager user interface (UI) is downloaded to the Windows or UNIX host and it runs within the browser. All requests from the UI go to the Storage Management Server software on the storage systems, which communicates with the SP Agent. The SP Agent, in turn, communicates with the FLARE or Access Logix™ software on the SPs.

With Navisphere 6.X, you can set up a portal system to manage systems that do not have Storage Management Server software installed (such as FC5300, FC4500, and NAS systems). The portal can be a storage system (storage-system portal), or a Windows Server 2003, Windows 2000, or Windows NT server (a server portal), and must have Storage Management Server software installed.
Figure 1-1 shows a sample Manager 6.X environment with Fibre Channel storage systems and an iSCSI storage system in a storage domain with various servers.

**Figure 1-1 FC and iSCSI Storage Systems in an IP Network**

Figure 1-2 shows a sample Manager 6.X environment with a Windows 2000 server configured as the portal. In this configuration, the portal server is managing the FC4500 and FC5300 systems. The Storage Management Server software on the portal communicates with the Host Agents on the servers attached to the storage systems.
The Host Agents communicate with the FLARE and Access Logix software on the SPs.

Figure 1-2 Sample Server Portal Environment
About EMC Navisphere 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 Navisphere Manager 6.X on storage systems that you will manage. Manager 6.X has a different architecture from the CLI, as explained on page 1-9. For more convenience with certain operations, you should install Navisphere Manager.

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

Install optional storage-system software, such as SnapView™ and/or SAN Copy™ 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 a 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 3-4.

For a shared storage overview, see the section *Shared Storage Setup and Management Overview* on page 4-2.

Configuring and Managing Remote Mirrors

Since the CLI communicates with the CX-Series and FC4700-Series SP Agent through one SP at a time, using the CLI to configure and manage a remote mirror is inefficient. We recommend that you use Navisphere Manager to do this because it can monitor both SPs on the primary and secondary storage systems and can also provide a more complete picture of the remote mirror configuration and status.
AX-Series Support

You can use Navisphere CLI to manage AX-Series storage systems. The CLI provides a command line interface for which you can write shell scripts to automate operations.

You must upgrade your storage system to Navisphere Manager, before you can use Navisphere CLI on an AX-Series storage system. Refer to the document for upgrading a storage system to Navisphere Manager.

If you plan to use Classic CLI (see About Classic CLI on page 2-11), add privileged users to the SP Agent configuration file, as described in the Navisphere Manager online help. This is not required for Secure CLI (see About Secure CLI on page 2-2) or Java CLI (see About Java CLI on page 2-29).

You cannot use Navisphere Express and Navisphere CLI to co-manage an AX-Series storage system. Once you install Navisphere CLI on an AX-Series storage system, Navisphere Express is no longer operational. You cannot uninstall Navisphere CLI once you install it.

In general, commands supported by CX-Series systems are supported by AX-Series systems. Because of some functionality differences, there are some commands that are unique to AX-Series systems and others that are not available. See the following table.
<table>
<thead>
<tr>
<th>Command</th>
<th>Supported on AX-Series only</th>
<th>Not supported on AX-Series</th>
<th>Some command switches only supported on AX-Series</th>
<th>Some command switches not supported on AX-Series</th>
</tr>
</thead>
<tbody>
<tr>
<td>alpa</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>arraycommpath</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>arrayname</td>
<td></td>
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<td></td>
<td></td>
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<tr>
<td>baseuuid</td>
<td>X</td>
<td></td>
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<td></td>
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<tr>
<td>bind</td>
<td></td>
<td>X</td>
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<tr>
<td>cachecard</td>
<td>X</td>
<td></td>
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<td>chglun</td>
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<td>chgrg</td>
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<tr>
<td>clearstats</td>
<td>X</td>
<td></td>
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<tr>
<td>failovermode</td>
<td></td>
<td></td>
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<tr>
<td>firmware</td>
<td></td>
<td>X</td>
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<tr>
<td>getcrus</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>getsniffer</td>
<td>X</td>
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<td></td>
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<tr>
<td>initializearray</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>metalun</td>
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<td></td>
<td>X</td>
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<tr>
<td>migrate</td>
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<tr>
<td>ndu</td>
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<tr>
<td>rebootpeerSP</td>
<td></td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>remoteconfig</td>
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<tr>
<td>responsetest</td>
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<tr>
<td>sc_off</td>
<td></td>
<td>X</td>
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<tr>
<td>selcache</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
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<tr>
<td>setsniffer</td>
<td></td>
<td>X</td>
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<td></td>
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<tr>
<td>setstats</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>shutdown</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>storagegroup</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>systemtype</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
What Next? Continue to the chapter listed below for the type of commands you want:

- Basic, unshared storage Chapter 3
- Storage Group, shared storage (Access Logix) Chapter 4
- LUN expansion (metaLUN) Chapter 5
- Reserved LUN pool Chapter 6
- Internet SCSI (iSCSI) Chapter 7
- LUN migration Chapter 8
- Domain and Security Chapter 9
This chapter explains the EMC Navisphere CLI commands navisecli, navicli, and navicli.jar. Major topics are

- About Secure CLI ................................................................. 2-2
- Getting Started With Secure CLI ......................................... 2-3
- navisecli ................................................................. 2-6
- About Classic CLI ............................................................. 2-11
- LUN IDs, Unique IDs, and Disk IDs ..................................... 2-12
- navicli ................................................................. 2-20
- About Java CLI ................................................................. 2-29
- Requirements for Using Java CLI ......................................... 2-29
- navicli.jar ................................................................. 2-31
About CLI Commands

About Secure CLI

Secure CLI is a comprehensive Navisphere CLI solution that provides one application and one security model for all CLI commands. Secure CLI combines key features of the existing Classic (see About Classic CLI on page 2-11) and Java CLI functionalities (see About Java CLI on page 2-29). Similar to Classic CLI, you do not need to install a JRE to run Secure CLI. Secure CLI implements the security features of Java CLI, providing role-based authentication, audit trails of CLI events, and SSL-based data encryption.

Secure CLI is not supported on all operating systems. Refer to the Host Agent/CLI and Utilities Release Notes, available on Powerlink, for a list of supported operating systems. You must be running FLARE Operating Environment version 02.19.xxx.5.yyy or higher, supported only on CX-Series or AX-Series systems.

Secure CLI commands run in a command window. Each command consists of the `naviseccli` command (and switches) together with another subcommand (and its switches). The `naviseccli` command replaces `navicli` (Classic CLI) and `java-jar navicli.jar` (Java CLI) in the command line and in general, preserves the original command syntax and output for script compatibility.

For commands that originated in Classic CLI, some command output may be enhanced, for example, Secure CLI can retrieve and display information from peer SPs. For Classic CLI commands that produce multiple warnings and require multiple confirmations, Secure CLI provides a single summary of warnings and a single confirmation.

Secure CLI does not support commands targeted to Host Agents, such as `-lunmapinfo` (see Navisphere Host and SP Agents on page 1-6 for information on Host and SP Agents). For commands that you can issue to either an SP or Host Agent, such as `getagent`, if you issue the command to a Host Agent, Secure CLI displays an error message. You must use Classic CLI to issue commands to Host Agents. For a list of commands that are not supported, see Appendix B.

Secure CLI does not distinguish case of characters, so, regardless of the host operating system, you can use either uppercase, lowercase, or any combination of characters as you type commands.
If a Secure CLI command fails and the CLI does not generate its own error message, it displays an error message from the SP Agent. Secure CLI generates errors about command line syntax for commands and options and their values.

Secure CLI commands return 0 if the command is successful. To retain consistency with previous commands, if the command fails, Secure CLI returns 1 for commands that originated in Java CLI and 1 or greater for commands that originated in Classic CLI.

Getting Started With Secure CLI

Before you begin to issue Secure CLI commands, you must create a Navisphere user account on the storage system. To create the required user accounts using Navisphere CLI, see Domain and Security Commands on page 9-1. For details on using Navisphere 6.X security, refer to the EMC Navisphere Security Administrator’s Guide.

You can also choose to configure a Navisphere 6.X security file to issue Secure CLI commands (see the next section, Overview of Using the Navisphere 6.X Security with Secure CLI) on the host. If you establish a security file, you do not need to include the switches -user, -scope, and -password (or the password prompt), in each command you issue.

Establishing a security file to use commands that originated in Classic CLI, ensures that other than the update from navicli to the naviseccli command, you do not need to modify any established scripts you may have. Secure CLI, unlike Classic CLI, requires the switches -user, -scope, and -password (or the password prompt) in each command line; you do not need to provide these switches in the command line if you establish a security file.
Overview of Using the Navisphere 6.X Security with Secure CLI

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

If you have an existing security file to issue Java CLI commands, you can use this to satisfy configuration requirements for the ndu Pre-Installation Validation Checks functionality (see ndu -install); however, you must create a new security file for Secure CLI commands. The security files can co-exist; however, you cannot use a security file implemented for Java CLI commands to issue Secure CLI commands. The security file you create using Secure CLI, implements a different architecture and additional enhancements, such as the -user and -secfilepath options.

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

When you create a security file, the username you use to log into the current host is automatically stored in the security file, or you can specify an alternative username for the security file in the -AddUserSecurity request using the optional -user switch. If you omit the -user switch, the security file uses your current username.

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

```
naviseccli -AddUserSecurity -password mypass -scope 0 -user altusername
```

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

Username and password are case sensitive.
The security file is stored in your default home directory. With Secure CLI, you can specify an alternative file path using the optional `-secfilepath` switch.

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

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

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

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

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

**Description**
The naviseccli command sends storage system management and configuration requests to a storage system via the Internet.

**User Access**
Anyone that can log in to the host running Navisphere CLI 6.X or later.

**Format**
The naviseccli command is used as follows:

```
naviseccli -help
or
naviseccli
```

```
[-address IPAddress | NetworkName | -h IPAddress | NetworkName]
[-AddUserSecurity]
[-f filename]
[-m]
[-nopoll | -np]
[-parse | -p]
[-password password]
[-port port]
[-q]
[-RemoveUserSecurity]
[-scope 0 | 1]
[-timeout | -t timeout]
[-user username]
[-v]
[-xml]
CMD [optional_command_switches]
```

where the naviseccli switches are

- **-help**
  Displays the help screen and does not start the naviseccli process. To start the naviseccli process, use one or more of the switches that follow instead.
-address IPAddress | NetworkName -h IPAddress | NetworkName

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

-AddUserSecurity

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

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

-f filename

Specifies to store data in a file.

-m

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

Only supported for commands that originated in Classic CLI.

-nopoll | -np

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

When the -nopoll switch is set, get commands may return stale data and set commands may erase previously changed settings. Use caution when the -nopoll switch is set.
-parse | -p

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

-password password

Specifies the password on the storage system you want to log in to. The password is visible in the command line. Passwords are case sensitive.

If you want to mask the password, and you are not using a security file, you can omit this switch from the command line. The CLI then prompts you to enter a password. The information you enter into the password prompt is concealed.

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

-port portnumber

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

-q

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

Only supported for commands that originated in Classic CLI.

-RemoveUserSecurity

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

-scope 0 | 1

Specifies whether the user account on the storage system you want to log in to is local or global. A 0 (default) indicates global; a 1 indicates local.
A global account is effective throughout the domain. When the administrator creates a global account, the software copies the definition of this account to the domain directory, which makes it accessible on all storage systems in the domain.

A local account is effective on only the storage systems for which the administrator creates the account. The user can log in to only those storage systems on which he or she has a local account.

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

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

-timeout | -t timeout
Sets the timeout value in seconds. The default is 600 seconds.

-user username
Specifies the username on the storage system you want to log in to. Usernames are case sensitive. You can omit this if your username has been added to the security file.

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

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

Only supported for commands that originated in Classic CLI.
**About CLI Commands**

-xml

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

**CMD**

One of a set of commands used with the naviseccli command.

**CMD Switches**

The CMD switches are described on the pages that follow.

**Spaces in Arguments**

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

If a filename or other argument includes a space, you must enclose the entire string that includes the name in quotation marks ("xx xx").
Classic CLI commands run in 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. Depending on your storage-system type and the revision of FLARE software (formerly called Base and Core Software) it is running, the number for RAID Group storage systems ranges from 223 to 1024. For non-RAID Group storage systems, the number is 32 (0-31). These ranges may have other restrictions depending on the operating system.

For CX-Series, FC4700-Series, or AX-Series storage systems, the variable `-d` (device name) option is not required because with these systems, 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, FC4700-Series, or AX-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 website 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), which is 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, 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 (bed 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.

AX-Series storage systems have only one back-end bus (*bus-number*=0) and only one enclosure (*enclosure-number*=0).

**Disk IDs**

Table 2-1 lists the CX-Series and FC4700-Series storage system models and their corresponding figures, which show their disk IDs.

An AX-Series storage system has a maximum of 12 disks, numbered 0-11.

**Table 2-1**  
**Figure List for Storage-System Disk IDs**

<table>
<thead>
<tr>
<th>Storage-System Disk IDs</th>
<th>Figure</th>
</tr>
</thead>
<tbody>
<tr>
<td>CX700 (limit 240 disks)</td>
<td>Figure 2-1 on page 2-14</td>
</tr>
<tr>
<td>CX600 (limit 240 disks)</td>
<td>Figure 2-2 on page 2-15</td>
</tr>
<tr>
<td>CX500 (limit 120 disks)</td>
<td>Figure 2-3 on page 2-16</td>
</tr>
<tr>
<td>CX400 (limit 60 disks)</td>
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</tr>
<tr>
<td>CX300 (limit 60 disks)</td>
<td>Figure 2-5 on page 2-17</td>
</tr>
<tr>
<td>CX200 (limit 30 disks)</td>
<td>Figure 2-6 on page 2-18</td>
</tr>
<tr>
<td>FC4700 (limit 120 disks)</td>
<td>Figure 2-7 on page 2-19</td>
</tr>
</tbody>
</table>
Navisphere Manager displays disk IDs as n-n-n. The CLI recognizes disk IDs as n_n_n.

Figure 2-1  CX700 Disk IDs
About CLI Commands

Navisphere Manager displays disk IDs as n-n-n. The CLI recognizes disk IDs as n_n_n.

Figure 2-2  CX600 Disk IDs
About CLI Commands

Navisphere Manager displays disk IDs as \textit{n-n-n}.
The CLI recognizes disk IDs as \textit{n\_n\_n}.

Figure 2-3  CX500 Disk IDs
Loop 0 Enclosures

Figure 2-4 CX400 Disk IDs

Loop 1 Enclosures

Navisphere Manager displays disk IDs as n-n-n.
The CLI recognizes disk IDs as n_n_n.

Vault disks

Figure 2-5 CX300 Disk IDs

LUN IDs, Unique IDs, and Disk IDs
Figure 2-6  CX200 Disk IDs

Figure 2-7 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.
About CLI Commands

Manager shows disk IDs as n-n-n.

The CLI recognizes disk IDs as n_n_n.
navicli

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

Before you can use Navisphere CLI commands to configure a storage system (as opposed to receive storage-system configuration or status information), you must be a privileged user in either the Host or SP Agent connected to the storage system. For pre-FC4700 storage systems, you must be a privileged user in the Host Agent configuration file. For FC4700-Series, CX-Series, or AX-Series storage systems, you must be a privileged user in the SP Agent configuration file on each SP in the storage system, and to use the navicli register and navicli lunmapinfo commands, you must be a privileged user in the Host Agent configuration file.

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
```

where the navicli switches are

- **-d device** (required only for pre-FC4700-Series storage systems)

  Specifies the communication channel to the storage system, for pre-FC4700 SPs only. (A CX-Series, FC4700-Series, or AX-Series SP is a host that you specify with the -h switch. The CLI ignores the -d switch for CX-Series, FC4700-Series, or AX-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 \textbf{-d} switch overrides the \texttt{RaidAgentDevice} environment variable. You can get a list of RAID devices present using the \texttt{getagent} command with \texttt{navicli}. The \texttt{device} name is listed as the “Node” in the output from \texttt{getagent}.

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

\textbf{-f filename}

Specifies to store data in a file.

\textbf{-h hostname}

Specifies the hostname of the storage-system SP or server. For a CX-Series, FC4700-Series, or AX-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 \texttt{RaidAgentHost} is the default for the server if the \texttt{-h} switch is not present. The \texttt{-h} switch overrides the \texttt{RaidAgentHost} setting. If \texttt{RaidAgentHost} is not set and the \texttt{-h} switch is not present, the local hostname is used.

\textbf{-help}

Displays the help screen and does not start the \texttt{navicli} process.

\textbf{-m}

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

\textbf{-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 \texttt{-np} switch is set, \texttt{get} commands may return stale data and \texttt{set} commands may erase previously changed settings. Use caution when the \texttt{-np} switch is set.
About CLI Commands

-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.

-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.

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

-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 c4.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 2-20 and 2-22. 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` 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.

```bash
set RaidAgentDevice  \\.A-9162244  (Windows device name)
set RaidAgentHost  server1  (or for CX/FC4700/AX, 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 pre-FC4700-Series storage system, 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:

```bash
navicli getagent -node -desc
```
### About CLI Commands

#### AIX Device Name Format

**For PowerPath devices:**

For an AIX operating system, PowerPath is not supported on pre-FC4700-Series storage systems.

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

\[ s^{n} \]

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 3-60. This applies to pre-FC4700-Series storage systems only.

#### HP-UX® Device Name Format

**For PowerPath devices:**

\[ cD^{t}S^{d}L^{l} \]

For pre-FC4700-Series storage systems, PowerPath is only supported on FC4500 and FC5300 systems. PowerPath 4.3 or higher is not supported on FC4500 and FC5300 systems.

**For other devices:**

\[ cD^{t}S^{d}L^{l} \]

where for Fibre Channel disks:

- \( D \) is the controller number assigned by the HP-UX host.
- \( S \) is equal to zero.
- \( L \) is equal to zero.

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.
About CLI Commands

$ is the SCSI ID of the storage system’s SP that is connected to 
SCSI bus $cD$. If the adapter identified by $cD$ 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 $tS$.

You can discover the communications channel device name using the 
navicli getagent command as shown earlier and on page 3-60. This 
applies to pre-FC4700-Series storage systems only.

IRIX Device Name Format

For a directly attached device (no switches):

```
scCdTL
```

where

- $C$ is the SP controller number that the IRIX® operating system 
  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_lunL_cCpP
```

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.

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 3-60. This 
applies to pre-FC4700-Series storage systems only.
About CLI Commands

**Linux® Device Name Format**

For PowerPath devices:

\[ \text{PwrP: sgX} \]

For other devices:

\[ \text{sgX} \]

where

\[ X \] is the letter or number that specifies the \text{sg} device.

You can discover the communications channel device name using the \text{navicli getagent} command as shown earlier and on page 3-60. This applies to pre-FC4700-Series storage systems only.

**Novell NetWare Device Name Format**

For PowerPath devices:

\[ \text{PwrP: Vm-Ad-Di:l} \]

For ATF (Application Transparent Failover) devices:

\[ \text{V6F1-Ad-Di:l} \]

For other devices:

\[ \text{Vm-Ad-Di:l} \]

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 \text{V596-A2-D0:2}.

You can discover the communications channel device name using the \text{navicli getagent} command as shown earlier and on page 3-60. This applies to pre-FC4700-Series storage systems only.
Solaris Device Name Format

For PowerPath devices:

\texttt{PwrP:cDtSdLsP}

For ATF (Application Transparent Failover) devices:

\texttt{clsp X}

For non PowerPath and non-ATF devices:

\texttt{cDtSdLsP}

where for Fibre Channel disks:

- \texttt{D} is the controller number the Solaris\textsuperscript{®} operating system assigns.
- \texttt{S} is the FC-AL or target address ID (decimal) of the storage system’s SP that is connected to fibre bus \texttt{cD}.
- \texttt{L} is the ID of a LUN owned by the SP identified by \texttt{tS}.
- \texttt{P} is the partition (slice) number.
- \texttt{X} is the SP number assigned using the \texttt{clsp} software.

and where for SCSI disks:

- \texttt{D} is the controller number the Solaris operating system assigns.
- \texttt{S} is the SCSI ID of the storage system’s SP that is connected to \texttt{cD}.
- \texttt{L} is the ID of a LUN owned by the SP identified by \texttt{tS}. This ID can range from 0 through 7.
- \texttt{P} is the partition (slice) number.

A sample Solaris device name is \texttt{PwrP:c1t0d0}.

You can discover the communications channel device name using the \texttt{navicli getagent} command as shown earlier and on page 3-60. This applies to pre-FC4700-Series storage systems 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 3-60. This applies to pre-FC4700-Series storage systems only.
About Java CLI

Java CLI is implemented in Java and its commands run in a command window. Each Java CLI command consists of the command `java -jar navicli.jar` and switches together with functions and function switches.

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

If a Java CLI command fails and the CLI does not generate its own error message, it displays an error message from the Host Agent or SP Agent. Java CLI generates errors about command line syntax for commands and options and their values. Java CLI commands return 0 if the command is successful and 1 if the command fails.

Requirements for Using Java CLI

Before you can use Java CLI commands, you must do the following:

1. Install a Java runtime environment (JRE). This is required for the `navicli.jar` command. For the latest JRE supported, see the EMC Navisphere Manager and Manager Base Release Notes.

2. Create a Navisphere user account on the storage system. To create the required user accounts using Navisphere CLI, see Domain and Security Commands on page 9-1. For details on using Navisphere 6.X security, refer to the EMC Navisphere Security Administrator’s Guide.

You can also choose to configure a Navisphere 6.X security file to issue Java CLI commands on the host (see the next section, Overview of Using the Navisphere 6.X Security with Java CLI).
Overview of Using the Navisphere 6.x Security with Java CLI

A storage system will not accept a command from Java CLI unless the user who issues the command has a valid user account on the storage system. You can specify a valid account username, password, and scope (global or local) in each command line, or, more conveniently, you can add password and scope information to the Navisphere security file and omit the password and scope from the command line. The Navisphere security file is an encrypted file stored for each user on each host. You can add or remove a password or scope from the security file using the -AddUserSecurity or -RemoveUserSecurity functions as arguments to the navicli.jar command.

You can create a user account on the storage system using the CLI (see Domain and Security Commands on page 9-1). The username on the storage system must match the username you used to log in to this server. Your current username is always passed to the storage system; you cannot specify a username in the -AddUserSecurity request.

For example, to add yourself under your current username to the security file on the current host, given the password mypass and the scope 0 (global scope), type

```
java -jar navicli.jar -AddUserSecurity -password mypass -scope 0
```

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

The password is passed to the storage system just as you typed it. It is case sensitive.
navicli.jar

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

Description
The java -jar navicli.jar command sends storage-system management and configuration requests to a storage system via the Internet.

User Access
Anyone that can log in to the host running Navisphere CLI 6.X or later.

Format
The navicli.jar command is used as follows:

```
java -jar navicli.jar  -help
or
java -jar navicli.jar
or for NetWare
java -jar [-ns | -nsac] navicli.jar  -help
```

```
[-address address]
[-AddUserSecurity]
[-nopoll]
[-parse]
[-password password]
[-port port]
[-RemoveUserSecurity]
[-scope 0 | 1]
[-timeout seconds]
[-user username]
[-xml]
CMD [optional_command_switches]
```

where the navicli.jar switches are

- **help**
  
  Displays the help screen and does not start the navicli.jar process. To start the navicli.jar process, use one or more of the switches that follow instead.

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

- **-AddUserSecurity**
  
  Directs the CLI to add user security information to the security file on this host. You must use the **-password** and **-scope** switches.

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

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

- **-ns | -nsac**
  
  For NetWare systems, creates a new screen for the Java application. One of these switches is needed with NetWare for CLI command output to appear on the screen. **-ns** creates a new screen for the Java application. **-nsac** also creates a new screen for the Java application, and automatically closes the screen when the application terminates.

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

- **-password**
  
  Specifies the password on the storage system you want to log in to. The password is case sensitive. You can omit this if you are using the security file.

- **-port**
  
  Sets the port number (type) of the storage system. The default is 443.

- **-RemoveUserSecurity**
  
  Directs the CLI to remove security information about the current user from the security file on this host.
-scope 0 | 1

Specifies whether the user account on the storage system you want to log in to is local or global. A 0 (default) indicates global; a 1 indicates local.

A global account is effective throughout the domain. When the administrator creates a global account, the software copies the definition of this account to the domain directory, which makes it accessible on all storage systems in the domain.

A local account is effective on only the storage systems for which the administrator creates the account. The user can log in to only those storage systems on which he has a local account.

-timeout seconds

Sets the time-out value in seconds. The default is 600 seconds.

-user username

Specifies the username on the storage system you want to log in to. You can omit this if your username has been added to the security file.

-xml

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

CMD

One of a set of commands used with the navicli.jar command.

The CLI will set the exit code before terminating. It sets the exit code to zero when the command executes successfully or to a value greater than zero when the command fails. Failures include command line parsing errors as well as errors encountered during the execution of the command.

CMD Switches

The CMD switches are described on the pages that follow.

Spaces in Arguments

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

If a filename or other argument includes a space, you must enclose the entire string that includes the name in quotation marks ("xx xx").
**What Next?**

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

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<tr>
<th>Category</th>
<th>Chapter</th>
</tr>
</thead>
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<td>Basic, unshared storage</td>
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<td>9</td>
</tr>
</tbody>
</table>
This chapter explains each of the basic variations; that is, the CLI commands that are common to all CLARiiON 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; CLI commands for the EMC MirrorView™/Asynchronous software are explained in the MirrorView/Asynchronous CLI manual; CLI commands for the EMC SAN Copy™ software are explained in the SAN Copy CLI manual; and CLI commands for EMC SnapView™ (for both snapshots and LUN clones) are explained in the SnapView admsnap and CLI manual.

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

Major topics are

- Storage Setup and Management Overview .................................... 3-4
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Basic Commands

Storage Setup and Management Overview

This section shows how you might configure and monitor a storage system using `naviseccli` or `navicli` 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 of system, in which each SP is a host. For an overview showing storage systems with Access Logix, see Chapter 4. For storage systems without Access Logix:

1. Create four RAID Groups.

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

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

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

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

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

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

   `naviseccli -h ss1_spa createrg 3 0_0_9`

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

2. Bind a LUN on each RAID Group.

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

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

   `naviseccli -h ss1_spa bind r1 1 -rg 1`

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

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

   Binds a LUN of type RAID 1 (mirrored pair) with LUN ID 2 on RAID Group 2. The LUN occupies all space on RAID Group 2, and caching is enabled by default.
naviseccli -h ss1_spa bind hs -rg 3
Binds a hot spare on RAID Group 2. The hot spare has no LUN ID (it is not really a LUN) and occupies all space on RAID Group 2.

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

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

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

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

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

    This command sets the write cache for SP A (applies to both SPs) to 650 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.

    naviseccli -h ss1_spa arrayname users11
    Change the arrayname from xxx to users11? (y/n) y

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

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

You can learn LUN device names using the getagent command and check status periodically using the getsp, getdisk, and/or getlun commands.
### alpa -get (FC4700-Series and later)

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, 0 or 1 for AX-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 naviseccli or navicli alpa command -get function lists ALPA information for an FC4700-Series and later 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.

#### User Access

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

For navicli, you must have a user entry in the Navisphere agent configuration file.

#### Format

alpa -get is used with naviseccli (described on page 2-6) or navicli (described on page 2-20) 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

```
naviseccli -h payroll_storage_spa alpa -get
```

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

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

To use this command with `navicli`, replace `naviseccli` with `navicli`.

### Output

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

`VALID_VALUES_0_3`
**Basic Commands**

**alpa -set (CX-Series or FC4700-Series only)**

Updates the SCSI ID associated with an SP port

**Description**

The `naviseccli` or `navicli alpa` command with the `-set` switch updates the SCSI ID value for the given port on a 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 (0-126) 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**

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

For `navicli`, you must have a user entry in the Navisphere agent configuration file.

**Format**

`alpa -set` is used with `naviseccli` (described on page 2-6) or `navicli` (described on page 2-20) as follows:

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

where

```
-sp a | b
```

Specifies the SP: A or B.
**Basic Commands**

- **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 126.

- **-o**
  
  Executes the command without prompting for confirmation.

**Conventions and Recommendations**

See the cautions above.

**Example**

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

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

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

To use this command with navicli, replace naviseccli with navicli.

**Output**

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

- VALID_VALUES_0_126
- VALID_VALUES_0_3
**arraycommpath (Not supported on AX-Series)**

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

**Description**

The `naviseccli` or `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 storage systems without Access Logix only. For storage systems with Access Logix, use the command `storagegroup sethost -arraycommpath` (see Chapter 4).

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**

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

For `navicli`, you must have a user entry in the Navisphere agent configuration file.

**Format**

`arraycommpath` is used with `naviseccli` (described on page 2-6) or `navicli` (described on page 2-20) 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

naviseccli -h ss1_spa arraycommpath 0

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

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

To use this command with navicli, replace naviseccli with navicli.

Output

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

Valid values are 0 or 1
arrayname

Renames a storage system

**Description**

The `navisecli` or `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).

AX-Series storage system names cannot exceed 32 characters in length.

The CLI prompts for confirmation as follows.

**User Access**

For `navisecli`, you must have a user account on the storage system on which you want to execute the command.

For `navicli`, you must have a user entry in the Navisphere agent configuration file. For a pre-FC4700-Series storage system, if configuration access control is enabled, you must issue the command from a trusted server (see `accesscontrol (FC4500 and FC5300)` on page 4-4).

**Format**

`arrayname` is used with `navisecli` (described on page 2-6) or `navicli` (described on page 2-20) as follows:

arrayname NewArrayName

where

NewArrayName Specifies the new name for the storage system.

**Conventions and Recommendations**

None

**Example**

`navisecli -h ss1_spa arrayname users11`

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

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

To use this command with `navicli`, replace `navisecli` with `navicli`.

**Output**

If the version of FLARE software running on the SP does not support this command, a Not Supported error message is printed to stderr.
baseuuid (Not supported on AX-Series)

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

**Description**

The naviseccli or 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**

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

For navicli, you must have a user entry in the Navisphere agent configuration file. For a pre-FC4700-Series storage system, if configuration access control is enabled, you must issue the command from a trusted server (see accesscontrol (FC4500 and FC5300) on page 4-4).

**Format**

baseuuid is used with naviseccli (described on page 2-6) or navicli (described on page 2-20) 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.

**Conventions and Recommendations**

None
**Basic Commands**

**Examples**

```
naviseccli  -h ss1_spa baseuuid
Base UUID of the array: 12345

naviseccli  -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`.

To use this command with `navicli`, replace `naviseccli` with `navicli`.

**Output**

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

Creates a LUN within an existing RAID Group

Description
The naviseccli or navicli 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 3-49).

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

As soon as a LUN is bound on a CX-Series running FLARE or Access Logix version 02.04.x.xx.5.xxx or lower or on any FC4700-Series storage system, you should start a background verify on the LUN with ASAP priority and set the sniffer rate for the LUN to 5. You can perform both these operations with the setsniffer command (see the Examples section of the command). You should not send data to the LUN until the background verify operation is complete. The background verify operation will eliminate any latent soft media errors prior to use of the LUN.

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

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

For navicli, you must have a user entry in the Navisphere agent configuration file. For a pre-FC4700-Series storage system, if configuration access control is enabled, you must issue the command from a trusted server (see accesscontrol (FC4500 and FC5300) on page 4-4).

Format
bind is used with naviseccli (described on page 2-6) or navicli (described on page 2-20) as follows:

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

AX-Series systems support only RAID 1/0 (r1_0), RAID 5 (r5), and Hot Spare (hs) raid types. Only one hot spare is supported.

lun

Specifies a decimal number to assign to the LUN (valid range is shown on page 2-12). 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 3-49).

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 (Not supported on AX-Series)

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 (Not supported on AX-Series)

Use this option only at the direction of CLARiiON Performance Engineering,
**Basic Commands**

- **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

- **noinitialverify** (Not supported on AX-Series)

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

- **offset logical-block-address** (Not supported on AX-Series)

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

- **pl** placement (Not supported on AX-Series)

  Places a LUN in a RAID Group. **placement** specifies which algorithm to use as follows:
  - **bf** = best fit algorithm (the default)
  - **ff** = first fit algorithm

- **r rebuild-priority** (Not supported on AX-Series)

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

---

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.

The rebuild priority properties are unavailable for RAID 0, Disk, or Hot Spare LUN.

-rc read-cache (Not supported on AX-Series)

   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)
   - tb = terabytes
   - sc = stripe count
   - bc = block count

   AX-Series systems support only megabyte (mb) and gigabyte (gb) size qualifiers.

-v verify-priority (Not supported on AX-Series)

   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.
The verify priority properties are unavailable for RAID 0, Disk, or Hot Spare LUN.

**Basic Commands**

**-wc write-cache** (Not supported on AX-Series)

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).

**Conventions and Recommendations**

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

### LUN Parameters for Different RAID Types

<table>
<thead>
<tr>
<th>RAID Type</th>
<th>Bind Parameters</th>
</tr>
</thead>
<tbody>
<tr>
<td>RAID 5, RAID 1/0</td>
<td>LUN number, Rebuild time, Stripe size, Read and/or write caching</td>
</tr>
<tr>
<td>RAID 3</td>
<td>LUN number, Rebuild time</td>
</tr>
<tr>
<td>RAID 1</td>
<td>LUN number, Rebuild time, Read and/or write caching</td>
</tr>
<tr>
<td>RAID 0</td>
<td>LUN number, Stripe size, Read and/or write caching</td>
</tr>
<tr>
<td>Disk (individual disk unit)</td>
<td>LUN number, Read and/or write caching</td>
</tr>
<tr>
<td>Hot Spare</td>
<td>LUN number</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>LUN to Bind</th>
<th>Restrictions and Recommendations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Any LUN</td>
<td>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.</td>
</tr>
<tr>
<td>RAID 5*</td>
<td>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.</td>
</tr>
<tr>
<td>RAID 3</td>
<td>You must bind exactly five or nine disk modules. Select 5 drives for quicker rebuild times or 9 drives for more efficient use of space. <strong>IMPORTANT</strong> For RAID 3, write caching is only supported on a CX-Series storage system running FLARE version 02.06.xxx.x.xxx or higher. For a storage system other than a CX-Series running FLARE version 02.06.xxx.x.xxx or higher, write-caching is not supported; therefore, when binding RAID 3 LUNs, the <code>-wc cache-flags</code> switch will not apply. When you check status on a RAID 3 LUN, write caching will appear disabled.</td>
</tr>
<tr>
<td>RAID 1</td>
<td>You must bind exactly two disk modules.</td>
</tr>
<tr>
<td>RAID 0</td>
<td>You must bind a minimum of three disk modules, and no more than sixteen disk modules.</td>
</tr>
<tr>
<td>RAID 1/0</td>
<td>You must bind a minimum of 2 disk modules, and an even number of modules, but no more than 16 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.</td>
</tr>
<tr>
<td>Individual disk unit</td>
<td>None</td>
</tr>
<tr>
<td>Hot Spare</td>
<td>You cannot bind certain disk modules as a hot spare on a storage system with Fibre Channel disks. For more information about such disk modules, refer to the configuration planning guide for your system. The capacity of a disk module bound as a hot spare must be at least as great as the capacity of the largest disk module that it might replace. <strong>IMPORTANT</strong> The <code>-c cache-flags</code> switch does not apply to a hot spare. When you check status on a hot spare, caching always appears disabled.</td>
</tr>
</tbody>
</table>

* 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 hot spare. For caching to occur, storage-system caching must also be enabled (page 3-18 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

<table>
<thead>
<tr>
<th>RAID Type</th>
<th>Write Caching</th>
<th>Read Caching</th>
</tr>
</thead>
<tbody>
<tr>
<td>RAID 0</td>
<td>Acceptable</td>
<td>Recommended</td>
</tr>
<tr>
<td>RAID 1</td>
<td>Acceptable</td>
<td>Recommended</td>
</tr>
<tr>
<td>RAID 1/0</td>
<td>Acceptable</td>
<td>Recommended</td>
</tr>
<tr>
<td>RAID 3*</td>
<td>Recommended</td>
<td>Recommended</td>
</tr>
<tr>
<td>RAID 5</td>
<td>Highly recommended</td>
<td>Recommended</td>
</tr>
<tr>
<td>Disk</td>
<td>Acceptable</td>
<td>Recommended</td>
</tr>
<tr>
<td>Hot Spare</td>
<td>Not Allowed</td>
<td>Not Allowed</td>
</tr>
</tbody>
</table>

* For RAID 3, write caching is only supported on a CX-Series storage system running FLARE version 02.06.xxx.x.xxx or higher. Read caching is only supported on a CX-Series or FC4700-Series storage system.

**IMPORTANT** LUNs cannot use write caching until you enable the storage-system write cache (page 3-194). LUNs cannot use read caching until you enable the read cache for the SP that owns the LUN (page 3-18 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 3-220), 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 3-37).
Basic Commands

**Examples**

```
naviseccli -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).

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

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

---

To use this command with `navicli`, replace `naviseccli` with `navicli`.

---

**Output**

There is no output. Errors are printed to `stderr`.
**bind (non-RAID Group) (Not supported on AX-Series)**

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

**Description**
The *naviseccli* or *navicli* `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.

As soon as a LUN is bound on a CX-Series running FLARE or Access Logix version 02.04.x.xx.5.xxx or lower or on any FC4700-Series storage system, you should start a background verify on the LUN with ASAP priority and set the sniffer rate for the LUN to 5. You can perform both these operations with the `setsniffer` command (see the Examples section of the command). You should not send data to the LUN until the background verify operation is complete. The background verify operation will eliminate any latent soft media errors prior to use of the LUN.

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

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

For *navicli*, you must have a user entry in the Navisphere agent configuration file.

**Format**
`bind` is used with *naviseccli* (described on page 2-6) or *navicli* (described on page 2-20) as follows:

```
bind raid-type [lun] disks [-aa auto_assignment] [-c cache-type] 
[-elsz stripe-element-size] [-n min_latency_reads] [-noinitialverify] 
[-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
**Basic Commands**

- 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 3-29).

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

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

Use this option only at the direction of CLARiiON Performance Engineering.

-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

-noinitialverify

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

-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.

   The rebuild priority properties are unavailable for RAID 0, Disk, or Hot
   Spare LUN.
-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.

The verify priority properties are unavailable for RAID 0, Disk, or Hot Spare LUN.

-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.

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

### LUN Parameters for Different RAID Types

<table>
<thead>
<tr>
<th>RAID Type</th>
<th>Bind Parameters</th>
</tr>
</thead>
<tbody>
<tr>
<td>RAID 5, RAID 1/0</td>
<td>LUN number</td>
</tr>
<tr>
<td></td>
<td>Rebuild time</td>
</tr>
<tr>
<td></td>
<td>Stripe size</td>
</tr>
<tr>
<td></td>
<td>Read and/or write caching</td>
</tr>
<tr>
<td>RAID 3</td>
<td>LUN number</td>
</tr>
<tr>
<td></td>
<td>Rebuild time</td>
</tr>
<tr>
<td>RAID 1</td>
<td>LUN number</td>
</tr>
<tr>
<td></td>
<td>Rebuild time</td>
</tr>
<tr>
<td></td>
<td>Read and/or write caching</td>
</tr>
</tbody>
</table>

bind (non-RAID Group) (Not supported on AX-Series)
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:

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

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

<table>
<thead>
<tr>
<th>RAID Type</th>
<th>Bind Parameters</th>
</tr>
</thead>
<tbody>
<tr>
<td>RAID 0</td>
<td>LUN number</td>
</tr>
<tr>
<td></td>
<td>Stripe size</td>
</tr>
<tr>
<td></td>
<td>Read and/or write caching</td>
</tr>
<tr>
<td>Disk (individual disk unit)</td>
<td>LUN number</td>
</tr>
<tr>
<td></td>
<td>Read and/or write caching</td>
</tr>
<tr>
<td>Hot Spare</td>
<td>LUN number</td>
</tr>
</tbody>
</table>
Restrictions and Recommendations for Binding Disks into LUNs

<table>
<thead>
<tr>
<th>LUN to Bind</th>
<th>Restrictions and Recommendations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Any LUN</td>
<td>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.</td>
</tr>
<tr>
<td>RAID 5*</td>
<td>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.</td>
</tr>
<tr>
<td>RAID 3</td>
<td>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. <strong>IMPORTANT</strong> 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.</td>
</tr>
<tr>
<td>RAID 1</td>
<td>You must bind exactly two disk modules.</td>
</tr>
<tr>
<td>RAID 0</td>
<td>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.</td>
</tr>
</tbody>
</table>
Basic Commands

<table>
<thead>
<tr>
<th>LUN to Bind</th>
<th>Restrictions and Recommendations</th>
</tr>
</thead>
<tbody>
<tr>
<td>RAID 1/0</td>
<td>You must bind a minimum of two 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.</td>
</tr>
<tr>
<td>Individual disk unit</td>
<td>None</td>
</tr>
<tr>
<td>Hot Spare</td>
<td>You cannot bind the following disk modules as hot spares:</td>
</tr>
<tr>
<td></td>
<td>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</td>
</tr>
</tbody>
</table>
|                     | 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 3-25). 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

<table>
<thead>
<tr>
<th>RAID Type</th>
<th>Write Caching</th>
<th>Read Caching</th>
</tr>
</thead>
<tbody>
<tr>
<td>RAID 0</td>
<td>Acceptable</td>
<td>Recommended</td>
</tr>
<tr>
<td>RAID 1</td>
<td>Acceptable</td>
<td>Recommended</td>
</tr>
<tr>
<td>RAID 1/0</td>
<td>Acceptable</td>
<td>Recommended</td>
</tr>
<tr>
<td>RAID 3</td>
<td>Recommended</td>
<td>Recommended</td>
</tr>
<tr>
<td>RAID 5</td>
<td>Highly recommended</td>
<td>Recommended</td>
</tr>
<tr>
<td>Disk</td>
<td>Acceptable</td>
<td>Recommended</td>
</tr>
<tr>
<td>Hot Spare</td>
<td>Not Allowed</td>
<td>Not Allowed</td>
</tr>
</tbody>
</table>

**IMPORTANT** LUNs cannot use write caching until you enable the storage-system write cache (page 3-194). 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

<table>
<thead>
<tr>
<th>Modules selected</th>
</tr>
</thead>
<tbody>
<tr>
<td>first</td>
</tr>
<tr>
<td>second</td>
</tr>
<tr>
<td>third</td>
</tr>
<tr>
<td>fourth</td>
</tr>
<tr>
<td>fifth</td>
</tr>
<tr>
<td>sixth</td>
</tr>
<tr>
<td>seventh</td>
</tr>
<tr>
<td>eighth</td>
</tr>
<tr>
<td>primary image</td>
</tr>
<tr>
<td>secondary image</td>
</tr>
</tbody>
</table>

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 3-220), 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 \texttt{chglun} command (page 3-37).

**Examples**

```
naviseccli -h ss1_spa 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.

To use this command with navicli, replace naviseccli with navicli.

**Output**

There is no output. Errors are printed to \texttt{stderr}.
cachecard -initialize (AX-Series (single-SP) only)

Initializes the cache memory card

Description

The navisecli or navicli cachecard command with the -initialize function lets you initialize the cache memory card.

The cachecard -initialize command can be issued under any of the following circumstances:
- a different cache memory card is installed on the storage system
- live data is on the cache memory card
- a LUN with an offline (cache dirty) condition exists on the storage system

User Access

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

For navicli, you must have a user entry in the Navisphere agent configuration file.

Format

cachecard -initialize is used with navisecli (described on page 2-6) or navicli (described on page 2-20) as follows.

cachecard -initialize [-o]

where

-o

Executes the command without prompting for confirmation.

Conventions and Recommendations

None.

Example

navisecli -h ss1_spa cachecard -initialize

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

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

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

To use this command with `navicli`, replace `naviseccli` with `navicli`.

**Output**  None if the command succeeds; status or error information if it fails.
cachecard -list (AX-Series (single-SP) only)

Lists the state information of the cache memory card

Description
The navisecli or navicli cachecard command with the -list function lists the state information of the cache memory card. The memory size and hardware state of the cache memory card is displayed.

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

The possible hardware states are listed in the following table.

<table>
<thead>
<tr>
<th>Hardware State</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>OK</td>
<td>The power on the main SP is on and the cache memory card battery is fully charged. The cache memory card is in normal operation.</td>
</tr>
<tr>
<td>Not present</td>
<td>The cache memory card is not present.</td>
</tr>
<tr>
<td>Faulted</td>
<td>The cache memory card has hardware faults.</td>
</tr>
<tr>
<td>Battery charging</td>
<td>The power on the main SP is on and the battery is charging on the cache memory card.</td>
</tr>
<tr>
<td>In wrong array</td>
<td>The cache memory card is from the wrong storage system.</td>
</tr>
</tbody>
</table>

User Access
For navisecli, you must have a user account on the storage system on which you want to execute the command.

For navicli, anyone that can log in to the host running the Navisphere CLI.

Format
cachecard -list is used with navisecli (described on page 2-6) or navicli (described on page 2-20) as follows.
cachecard -list [-size] [-hwstate]

where
-size
   Specifies to display only the total memory size of the cache memory card (Mbytes).
-hwstate

Specifies to display only the hardware state of the cache memory card.

Conventions and Recommendations

None.

Example

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

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

To use this command with navicli, replace naviseccli with navicli.

Output

```
Total Memory: 512MB
Hardware State: Ok
```
Changes parameters on a currently bound LUN

Description
The navisecli or navicli 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.

To change a metaLUN, use the navisecli or navicli.jar metalun command with the -modify switch, as described on page 5-22.

User Access
For navisecli, you must have a user account on the storage system on which you want to execute the command.

For navicli, you must have a user entry in the Navisphere agent configuration file. For a pre-FC4700-Series storage system, if configuration access control is enabled, you must issue the command from a trusted server (see accesscontrol (FC4500 and FC5300) on page 4-4).

Format
chglun is used with navisecli (described on page 2-6) or navicli (described on page 2-20) 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. This switch is required.

The optional switches are

- **-a auto-assign** (Not supported on AX-Series)
  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 (Not supported on AX-Series)

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 3-31 (non-RAID group) or 3-21 (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 (Not supported on AX-Series)

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 (Not supported on AX-Series)

Sets the default prefetch values.

-i idle-thresh (Not supported on AX-Series)

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

-mp max-prefetch-blocks (Not supported on AX-Series)

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 FLARE software that supports Storage Group commands. The LUN name is displayed in the UI and has no other purpose. You cannot use the LUN name as a CLI command argument. You can assign the same name to multiple LUNs.

The -name switch applies only to shared storage systems.

-pc max-prefetch-IO (Not supported on AX-Series)
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 (Not supported on AX-Series)
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 (Not supported on AX-Series)
Sets or disables the prefetch type as follows:
  0 = Disables prefetch
  1 = Constant length prefetch type
  2 = Variable length prefetch type

-pm pf-size-or-multiplier (Not supported on AX-Series)
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** (Not supported on AX-Series)

Sets the rebuild priority. *rebuild-priority* specifies the priority at which to reconstruct data on either a hot spare or a new disk module that replaces a failed disk module in a LUN. It applies to all RAID 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** (Not supported on AX-Series)

Enables or disables retaining prefetch data functionality. *retain-prefetch-data* specifies functionality as follows:

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

---

**-sm prefetch-segment-size/mult** (Not supported on AX-Series)

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

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

If *-pf prefetch-type* is set to variable length, *segmt-size/mult* specifies the multiplier used to determine the segment size. Valid range: 0-32.
-t idle-delay-time (Not supported on AX-Series)

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 (Not supported on AX-Series)

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 (Not supported on AX-Series)

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

Caching Recommendations for Different RAID Types

<table>
<thead>
<tr>
<th>RAID Type</th>
<th>Write Caching</th>
<th>Read Caching</th>
</tr>
</thead>
<tbody>
<tr>
<td>RAID 0</td>
<td>Acceptable</td>
<td>Recommended</td>
</tr>
<tr>
<td>RAID 1</td>
<td>Acceptable</td>
<td>Recommended</td>
</tr>
<tr>
<td>RAID 1/0</td>
<td>Acceptable</td>
<td>Recommended</td>
</tr>
<tr>
<td>RAID 3*</td>
<td>Recommended</td>
<td>Recommended</td>
</tr>
<tr>
<td>RAID 5</td>
<td>Highly recommended</td>
<td>Recommended</td>
</tr>
<tr>
<td>Disk</td>
<td>Acceptable</td>
<td>Recommended</td>
</tr>
<tr>
<td>Hot Spare</td>
<td>Not Allowed</td>
<td>Not Allowed</td>
</tr>
</tbody>
</table>

*For RAID 3, write caching is only supported on a CX-Series storage system running FLARE version 02.06.xxx.x.xxx or higher. Read caching is only supported on a CX-Series or FC4700-Series storage system.
IMPORTANT LUNs cannot use write caching until you enable the write cache (page 3-194). 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.

**Example**

```
naviseccli -h ss1_sp a chglun -l 3 -c write -r high
```

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

To use this command with navicli, replace `naviseccli` with `navicli`.

**Output**

There is no output. Errors are printed to `stderr`. 
chgrg (RAID Group)

Changes properties of a RAID Group

Description
The naviseccli or navicli 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, rglD.

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

For navicli, you must have a user entry in the Navisphere agent configuration file. For a pre-FC4700-Series storage system, if configuration access control is enabled, you must issue the command from a trusted server (see accesscontrol (FC4500 and FC5300) on page 4-4).

Format
chgrg is used with naviseccli (described on page 2-6) or navicli (described on page 2-20) as follows:


where

rgID

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

The optional switches are

-defrag (Not supported on AX-Series)

Starts defragmenting the specified RAID Group.

-expand disks

Expands the RAID Group rglD 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 3-29).
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, 1_2_3 represents bus 1, 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 2-12.

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

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

### 20-Slot Chassis

<table>
<thead>
<tr>
<th>SCSI Bus</th>
<th>Disk Position</th>
<th>Disk ID</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>0, 1, 2, 3</td>
<td>A0, A1, A2, A3</td>
</tr>
<tr>
<td>B</td>
<td>0, 1, 2, 3</td>
<td>B0, B1, B2, B3</td>
</tr>
<tr>
<td>C</td>
<td>0, 1, 2, 3</td>
<td>C0, C1, C2, C3</td>
</tr>
<tr>
<td>D</td>
<td>0, 1, 2, 3</td>
<td>D0, D1, D2, D3</td>
</tr>
<tr>
<td>E</td>
<td>0, 1, 2, 3</td>
<td>E0, E1, E2, E3</td>
</tr>
</tbody>
</table>
10-Slot Chassis

<table>
<thead>
<tr>
<th>SCSI Bus</th>
<th>Disk Position</th>
<th>Disk ID</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>0, 1, 2, 3, 4</td>
<td>A0, A1, A2, A3, A4</td>
</tr>
<tr>
<td>B</td>
<td>0, 1, 2, 3, 4</td>
<td>B0, B1, B2, B3, B4</td>
</tr>
</tbody>
</table>

**-lex expansion** (Not supported on AX-Series)

Available only when the **-expand disks** switch is used. Not available for storage systems that support metaLUNs.

*expansion* specifies functionality as follows:

- **yes** = Enables LUN expansion for the specified RAID Group
- **no** = Disables LUN expansion for the specified RAID Group (the default)

**-pri priority** (Not supported on AX-Series)

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

- **high** = high priority
- **medium** = medium priority
- **low** = low priority

**-rm yes | no** (Not supported on AX-Series)

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** (Not supported on AX-Series)

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

- **a** = SP A
- **b** = SP B

**Conventions and Recommendations**

None
**Example**

`naviseccli -h ss1_spa chgrp 2 -trespass a`

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

To use this command with `navicli`, replace `naviseccli` with `navicli`.

**Output**

None
clearlog

Clears the SP’s error log

**Description**

The `naviseccli` or `navicli clearlog` command deletes the contents of the SP’s unsolicited error log.

For FC4700-Series and later storage systems, 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**

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

For `navicli`, 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 4-4).

**Format**

`clearlog` is used with `naviseccli` (described on page 2-6) or `navicli` (described on page 2-20) as follows:

```plaintext
clearlog
```

**Conventions and Recommendations**

None

**Example**

```plaintext
naviseccli -h ss1_spa clearlog
unsolicited error log cleared
This command deletes the SP logs of the storage system.
```

To use this command with `navicli`, replace `naviseccli` with `navicli`.

**Output**

Confirmation message.
clearstats (Not supported on AX-Series)

Resets the SP's statistics logging

Description
The naviseccli or navicli 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
For naviseccli, you must have a user account on the storage system on which you want to execute the command.

For navicli, 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 4-4).

Format
clearstats is used with naviseccli (described on page 2-6) or navicli (described on page 2-20) as follows:

clearstats

Conventions and Recommendations
None

Example
naviseccli -h ss1_spa clearstats

Statistics successfully cleared, statistics logging disabled.

To use this command with navicli, replace naviseccli with navicli.

Output
Confirmation message.
createrg (RAID Group)

Creates a RAID Group

Description

The naviseccli or navicli 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

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

For navicli, 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 4-4).

Format

createrg is used with naviseccli (described on page 2-6) or navicli (described on page 2-20) 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. In a RAID 1/0 or RAID 1 configuration, you can manually select the disks for the RAID Group in such an order as to determine the primary and secondary image. For example, for a 1/0 RAID Group, the first two disks you list in the command form a pair of mirrored images, and the next two disks form another pair of mirrored images, and so on.

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.
Basic Commands

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 2-12.

The disks in a RAID Group must be either all Fibre Channel disks or all ATA disks.

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

**Example**

naviseccli -h ss1_spa 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.

To use this command with navicli, replace naviseccli with navicli.

**Output**

None
failback (pre-FC4700 only)

Returns control of the fibre loop

This command applies only to Fibre Channel storage systems.

Description

The navicli 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 4-4).

Format

failback is used with navicli (described on page 2-20) as follows:

failback

Conventions and Recommendations

None

Example

navicli -h server1 failback

Output

There is no output. Errors are printed to stderr.
failovermode (Not supported on AX-Series)

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

Description
The naviseccli or 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 EMC Installation Roadmap for CX-Series, AX-Series, and FC-Series Storage Systems, which is on the EMC Powerlink website.

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

This command works for storage systems without Access Logix only. For storage systems with Access Logix, use the command storagegroup sethost -failovermode (see Chapter 4).

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

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

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

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

For navicli, you must have a user entry in the Navisphere agent configuration file.

Format
failovermode is used with naviseccli (described on page 2-6) or navicli (described on page 2-20) as follows:

```
failovermode [ 0 | 1 | 2 | 3 ] [-o]
```

For information about when to use these failover modes, refer to the EMC Installation Roadmap for CX-Series, AX-Series, and FC-Series Storage Systems, which is on the EMC Powerlink website.
-o

Executes the command without prompting for confirmation.

Conventions and Recommendations

None

Example

naviseclli  -h ss1_spa  failovermode  0

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

For ss1_spa, this command enables failover mode 0.

To use this command with navicli, replace naviseclli with navicli.

Output

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

Command not Supported
Valid values are 0 to 3
firmware (Not supported on AX-Series)

Updates the SP FLARE software and/or disk firmware

**Description**

The `naviseccli` or `navicli firmware` command updates the SP FLARE software (firmware) and/or disk firmware.

To update a CX-Series or FC4700-Series SP's FLARE 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**

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

For `navicli`, 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 4-4).

**Format**

`firmware` is used with `naviseccli` (described on page 2-6) or `navicli` (described on page 2-20) as follows:

```
firmware filename [-c] [-d disks] [-r | -w] [-o]
```

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.
Basic Commands

-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, 1_2_3 represents bus 1, 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 2-12.

For a storage system with SCSI disks:
*disks* has the format *b_d*, 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**

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

**20-Slot Chassis**

<table>
<thead>
<tr>
<th>SCSI Bus</th>
<th>Disk Position</th>
<th>Disk ID</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>0, 1, 2, 3</td>
<td>A0, A1, A2, A3</td>
</tr>
<tr>
<td>B</td>
<td>0, 1, 2, 3</td>
<td>B0, B1, B2, B3</td>
</tr>
<tr>
<td>C</td>
<td>0, 1, 2, 3</td>
<td>C0, C1, C2, C3</td>
</tr>
<tr>
<td>D</td>
<td>0, 1, 2, 3</td>
<td>D0, D1, D2, D3</td>
</tr>
<tr>
<td>E</td>
<td>0, 1, 2, 3</td>
<td>E0, E1, E2, E3</td>
</tr>
</tbody>
</table>

**10-Slot Chassis**

<table>
<thead>
<tr>
<th>SCSI Bus</th>
<th>Disk Position</th>
<th>Disk ID</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>0, 1, 2, 3, 4</td>
<td>A0, A1, A2, A3, A4</td>
</tr>
<tr>
<td>B</td>
<td>0, 1, 2, 3, 4</td>
<td>B0, B1, B2, B3, B4</td>
</tr>
</tbody>
</table>

- **-o**
  
  Executes the command without prompting 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.
Basic Commands

-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

Example

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

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

To use this command with navicli, replace naviseccli with navicli.

Output

A warning message appears before the command is issued to the storage system. Errors are printed to stderr.
Basic Commands

**flashleds**

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

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

**User Access**
Reads a stored Event Monitor log file

**Description**
The naviseccli or navicli 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 FC4700-Series and later storage systems, 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**
For naviseccli, you must have a user account on the storage system on which you want to execute the command.

For navicli, you must be able to log in to the host running Navisphere CLI.

**Format**
flashleds is used with naviseccli (described on page 2-6) or navicli (described on page 2-20) 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).
Basic Commands

-b bus-number

Specifies the bus-number, which is 0 or 1. Use this switch only for CX-Series storage systems. 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

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

To use this command with navicli, replace naviseccli with navicli.

Output

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

Gets device names and configurations

**Description**

The `naviseccli` or `navicli 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 FC4700-Series and later storage systems, 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.

If you are running a VMware ESX Server and you are issuing this command from a virtual machine (VM), please note this command requires the Navisphere Host Agent which is not supported on a VM. The Navisphere Host Agent is only supported on the ESX Server console.

**User Access**

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

For `navicli`, you must be able to log in to the host running Navisphere CLI.

**Format**

`getagent` is used with `naviseccli` (described on page 2-6) or `navicli` (described on page 2-20) as follows:

```
```

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.

---

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

-**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.
Basic Commands

-os
Displays the operating system.

-peersig
Returns the signature of the peer SP.

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

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

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

-serial
Returns the serial number of the storage system.

-sig
Returns the unique SP signature.

-spid
Returns the SP identifies (A or B).

-type
Returns the model type (deskside or rackmount).

-ver
Returns the version of the agent that is running.

Conventions and Recommendations
None
Example

This example issues the `getagent` command to storage system ss1_spa.

```
naviseccli -h ss1_spa getagent
```

Sample output follows.

To use this command with `navicli`, replace `naviseccli` with `navicli`.

Output

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

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

Output from an SP Agent

```
Agent Rev:       6.1.0 (8.4)
Name:           K10
Desc:           
Node:           A-WRE00021400494
Physical Node:  K10
Signature:      588114
Peer Signature: 588069
Revision:       2.01.1.01.001
SCSI Id:        0
Model:          600
Model Type:     Rackmount
Prom Rev:       2.12.00
SP Memory:      2048
Serial No:      WRE00021400494
SP Identifier:  A
Cabinet:        xPE
```
Basic Commands

getall

**getall**

Gets comprehensive storage-system information.

**Description**

The `naviseccli` or `navicli 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
- SANCopy information
- Drive type for enclosures, disks, RAID Groups, and LUNs

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

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

For FC4700-Series and later storage systems, 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.

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, sancopy items are displayed only if SANCopy software is installed and activated.

**User Access**

For `naviseccli`, you must have a user account on the storage system on which you want to execute the command.
For navicli, you must be able to log in to the host running Navisphere CLI.

**Format**

`getall` is used with naviseccli (described on page 2-6) or navicli (described on page 2-20) as follows:

```
```

- **-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 link control card (LCC). This is a composite of information displayed by the `getarrayuid`, `arrayname`, `getcrus`, and `initializearray` 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.

- **-drivetype**
  
  Displays the drive type of the LUN as Fibre Channel or ATA.
Basic Commands

-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.

reserved
   Displays the reserved LUN pool information.

-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.

-sancopy
   Displays only information about sancopy. This is the same information displayed by the sancopy command.
Output Formats

Agent/Host Information (Same as Returned by Command getsp)

<table>
<thead>
<tr>
<th>Server IP Address: 10.15.22.176</th>
<th>Server/SP IP address</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agent Rev: 5.3.0 (5.0)</td>
<td>Revision of the agent.</td>
</tr>
</tbody>
</table>

Agent/Host Information
----------------------

<table>
<thead>
<tr>
<th>Desc: MY_K10</th>
<th>ASCII description of device.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Node: A-F20011000207</td>
<td>Device name or location in file system of device. Use this value when specifying the command line device name.</td>
</tr>
</tbody>
</table>

Physical Node: K10

<table>
<thead>
<tr>
<th>Signature: 196618</th>
<th>Unique signature of SP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Peer Signature: 176166</td>
<td>Unique signature of peer SP</td>
</tr>
<tr>
<td>SCSI Id: 0</td>
<td>SCSI id of SP host connection</td>
</tr>
<tr>
<td>SP Identifier: A</td>
<td>SP Identifier (A or B)</td>
</tr>
<tr>
<td>Model: 4700-2</td>
<td>Model number of SP</td>
</tr>
<tr>
<td>Model Type: Rackmount</td>
<td>Model Type (deskside, rackmount)</td>
</tr>
<tr>
<td>Prom Rev: 5.94.00</td>
<td>Prom revision.</td>
</tr>
<tr>
<td>SP Memory: 817</td>
<td>SP memory in megabytes.</td>
</tr>
<tr>
<td>Serial No: F20011000207</td>
<td>Serial number of device.</td>
</tr>
<tr>
<td>Cabinet: DPE</td>
<td>cabinet type (DPE)</td>
</tr>
</tbody>
</table>

Installed packages:

<table>
<thead>
<tr>
<th>Name of the software package: Base</th>
<th>Package name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Revision of the software package: 01_89_35</td>
<td>Package revision</td>
</tr>
<tr>
<td>Commit Required: NO</td>
<td>YES / NO</td>
</tr>
<tr>
<td>Revert Possible: NO</td>
<td>YES / NO</td>
</tr>
<tr>
<td>Active State: YES</td>
<td>YES / NO</td>
</tr>
</tbody>
</table>

Dependent packages:

<table>
<thead>
<tr>
<th>MirrorView 01_89_25, Navisphere 5.3.0</th>
<th>Dependency information</th>
</tr>
</thead>
</table>

Required packages:

<table>
<thead>
<tr>
<th>Navisphere &gt;5.2.0.0.0, Base &lt;01_89_99, Base &gt;01_80_00,</th>
<th>Required package revision information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Is installation completed: YES</td>
<td>YES / NO</td>
</tr>
<tr>
<td>Is this System Software: NO</td>
<td>YES / NO</td>
</tr>
</tbody>
</table>
### Basic Commands

**Storage-System Information (-array switch) (Same Information Is Returned by Commands getcru and initializearray -list)**

<table>
<thead>
<tr>
<th>Array Information</th>
<th>---------------</th>
<th>---------------</th>
</tr>
</thead>
<tbody>
<tr>
<td>Array Name:</td>
<td>Array_2</td>
<td>Storage_2</td>
</tr>
<tr>
<td>Array UID:</td>
<td>50:06:01:60:20:04:A0:CF</td>
<td>50:06:01:60:20:04:A0:CF</td>
</tr>
</tbody>
</table>

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

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

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

- Raid Group ID: 223
- Logical Units Used: 223
- List of disks:
  - 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 0 Disk 6

Information about the PSM LUN (created at system installation)
## 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
- **Server Name:** navi2280.us.dg.com
- **Server IP Address:** 12.34.56.78
- **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 Port ID:** 0
- **HBA Devicename:** N/A
- **Trusted:** NO
- **Logged In:** NO
- **Defined:** YES
- **Initiator Type:** 0
- **StorageGroup Name:** Server1_SG

(HBA and HBA port listings continue here.)

Information about each SPPORT:

- **SP Name:** SP A
- **SP Port ID:** 0
- **SP UID:** 50:06:01:60:20:04:A0:CF:50:06:01:60:40:04:A0:CF
- **Link Status:** Down
- **Port Status:** DISABLED
- **Switch Present:** NO
- **ALPA Value:** 0
- **Speed Value:** 1

(SP B and SP B port information appears here.)
### Basic Commands

#### SP Information

<table>
<thead>
<tr>
<th>Information</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Storage Processor:</td>
<td>SP A A or B</td>
</tr>
<tr>
<td>Storage Processor Network Name:</td>
<td>naviqa22176</td>
</tr>
<tr>
<td>Storage Processor IP Address:</td>
<td>10.15.22.176</td>
</tr>
<tr>
<td>Storage Processor Subnet Mask:</td>
<td>255.255.255.0</td>
</tr>
<tr>
<td>Storage Processor Gateway Address:</td>
<td>10.15.22.1</td>
</tr>
<tr>
<td>System Fault LED:</td>
<td>OFF</td>
</tr>
<tr>
<td>Statistics Logging:</td>
<td>ON</td>
</tr>
<tr>
<td>System Date:</td>
<td>08/15/2001</td>
</tr>
<tr>
<td>Day of the week:</td>
<td>Wednesday</td>
</tr>
<tr>
<td>System Time:</td>
<td>08:37:00</td>
</tr>
<tr>
<td>Max Requests:</td>
<td>1</td>
</tr>
<tr>
<td>Average Requests:</td>
<td>4294967295</td>
</tr>
<tr>
<td>Prct Busy:</td>
<td>0</td>
</tr>
<tr>
<td>Prct Idle:</td>
<td>0</td>
</tr>
<tr>
<td>Hard errors:</td>
<td>0</td>
</tr>
<tr>
<td>Read requests:</td>
<td>0</td>
</tr>
<tr>
<td>Write requests:</td>
<td>0</td>
</tr>
<tr>
<td>Total Reads:</td>
<td>0</td>
</tr>
<tr>
<td>Total Writes:</td>
<td>0</td>
</tr>
<tr>
<td>Blocks_read:</td>
<td>0</td>
</tr>
<tr>
<td>Blocks_written:</td>
<td>0</td>
</tr>
<tr>
<td>Sum_queue_lengths_by_arrivals:</td>
<td>0</td>
</tr>
<tr>
<td>Arrivals_to_non_zero_queue:</td>
<td>0</td>
</tr>
<tr>
<td>Hw_flush_on:</td>
<td>0</td>
</tr>
<tr>
<td>Idle_flush_on:</td>
<td>31</td>
</tr>
<tr>
<td>Lw_flush_off:</td>
<td>0</td>
</tr>
<tr>
<td>Write_cache_flushes:</td>
<td>0</td>
</tr>
<tr>
<td>Write_cache_blocks_flushed:</td>
<td>0</td>
</tr>
<tr>
<td>Internal bus 1 busy ticks:</td>
<td>4294967295</td>
</tr>
<tr>
<td>Internal bus 1 idle ticks:</td>
<td>4294967295</td>
</tr>
<tr>
<td>Internal bus 2 busy ticks:</td>
<td>0</td>
</tr>
<tr>
<td>Internal bus 2 idle ticks:</td>
<td>0</td>
</tr>
<tr>
<td>Internal bus 3 busy ticks:</td>
<td>0</td>
</tr>
<tr>
<td>Internal bus 3 idle ticks:</td>
<td>0</td>
</tr>
<tr>
<td>Internal bus 4 busy ticks:</td>
<td>0</td>
</tr>
<tr>
<td>Internal bus 4 idle ticks:</td>
<td>0</td>
</tr>
<tr>
<td>Internal bus 5 busy ticks:</td>
<td>0</td>
</tr>
<tr>
<td>Internal bus 5 idle ticks:</td>
<td>0</td>
</tr>
<tr>
<td>Controller busy ticks:</td>
<td>20787</td>
</tr>
<tr>
<td>Controller idle ticks:</td>
<td>1617657</td>
</tr>
</tbody>
</table>

*(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
SPA Write Cache State: Enabled
SPA Write Cache State: Enabled
SPS Test Day: Saturday
SPS Test Time: 21:00
SPA Physical Memory Size = 817
SPA Free Memory Size = 399
SPA Physical Memory Size = 817
SPA 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 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

Read cache information
Total Hard Errors: 0
Total Soft Errors: 0
Total Queue Length: 0
RAID-3 Memory Allocation: 0
Minimum latency reads N/A

Hard read and write errors
Soft (correctable) errors
### Basic Commands

<table>
<thead>
<tr>
<th>Performance information (recorded only if Statistics logging is on)</th>
</tr>
</thead>
</table>

Read Histogram[0] 0  
Read Histogram[1] 0  
*(Read Histogram 2 through 10 information appears.)*  
Write Histogram[0] 0  
Write Histogram[1] 0  
*(Write Histogram 2 through 10 information appears.)*  

<table>
<thead>
<tr>
<th>Read Requests:</th>
<th>0</th>
</tr>
</thead>
<tbody>
<tr>
<td>Write Requests:</td>
<td>0</td>
</tr>
<tr>
<td>Blocks read:</td>
<td>0</td>
</tr>
<tr>
<td>Blocks written:</td>
<td>0</td>
</tr>
<tr>
<td>Read cache hits:</td>
<td>0</td>
</tr>
<tr>
<td>Read cache misses:</td>
<td>0</td>
</tr>
<tr>
<td>Prefetched blocks:</td>
<td>0</td>
</tr>
<tr>
<td>Unused prefetched blocks:</td>
<td>0</td>
</tr>
<tr>
<td>Write cache hits:</td>
<td>0</td>
</tr>
<tr>
<td>Forced flushes:</td>
<td>0</td>
</tr>
<tr>
<td>Read Hit Ratio:</td>
<td>0</td>
</tr>
<tr>
<td>Write Hit Ratio:</td>
<td>0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>RAID Type:</th>
<th>RAID5</th>
</tr>
</thead>
<tbody>
<tr>
<td>RAID Group ID:</td>
<td>0</td>
</tr>
<tr>
<td>State:</td>
<td>Bound</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Stripe Crossing:</th>
<th>0</th>
</tr>
</thead>
<tbody>
<tr>
<td>Element Size:</td>
<td>128</td>
</tr>
<tr>
<td>Current owner:</td>
<td>SP B</td>
</tr>
<tr>
<td>Offset:</td>
<td>0</td>
</tr>
<tr>
<td>Auto-trespass:</td>
<td>DISABLED</td>
</tr>
<tr>
<td>Auto-assign:</td>
<td>DISABLED</td>
</tr>
<tr>
<td>Write cache:</td>
<td>ENABLED</td>
</tr>
<tr>
<td>Read cache:</td>
<td>ENABLED</td>
</tr>
<tr>
<td>Idle Threshold:</td>
<td>0</td>
</tr>
<tr>
<td>Idle Delay Time:</td>
<td>20</td>
</tr>
<tr>
<td>Write Aside Size:</td>
<td>1023</td>
</tr>
<tr>
<td>Default Owner:</td>
<td>SP B</td>
</tr>
<tr>
<td>Rebuild Priority:</td>
<td>ASAP</td>
</tr>
<tr>
<td>Verify Priority:</td>
<td>Low</td>
</tr>
<tr>
<td>Prct Reads Forced Flushed:</td>
<td>0</td>
</tr>
<tr>
<td>Prct Writes Forced Flushed:</td>
<td>0</td>
</tr>
<tr>
<td>Prct Rebuilt:</td>
<td>100</td>
</tr>
<tr>
<td>Prct Bound:</td>
<td>100</td>
</tr>
<tr>
<td>LUN Capacity(Megabytes):</td>
<td>1024</td>
</tr>
<tr>
<td>LUN Capacity(Blocks):</td>
<td>2097152</td>
</tr>
</tbody>
</table>

*(Listing for additional LUNs appears here.)*
LUN Pool Information (Same as Returned by Command reserved -lunpool -list)

<table>
<thead>
<tr>
<th>Name of the SP:</th>
<th>SP A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Number of LUNs in Pool:</td>
<td>9</td>
</tr>
<tr>
<td>Number of Unallocated LUNs in Pool:</td>
<td>4</td>
</tr>
<tr>
<td>Unallocated LUNs:</td>
<td>14, 24, 23, 22</td>
</tr>
<tr>
<td>Allocated LUNs:</td>
<td>16, 17, 18, 20, 21</td>
</tr>
<tr>
<td>Total size in GB:</td>
<td>4.488281</td>
</tr>
<tr>
<td>Unallocated size in GB:</td>
<td>1.292969</td>
</tr>
<tr>
<td>Used LUN Pool in GB:</td>
<td>0.017639</td>
</tr>
<tr>
<td>% Used of LUN Pool:</td>
<td>0.393005</td>
</tr>
<tr>
<td>Chunk size in disk blocks:</td>
<td>128</td>
</tr>
</tbody>
</table>
## RAID Group Information (Same as Returned by Command getrg)

<table>
<thead>
<tr>
<th>All RAID Groups Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>RaidGroup ID: 0</td>
</tr>
<tr>
<td>RaidGroup Type: r5</td>
</tr>
<tr>
<td>RaidGroup State: Explicit_Remove Valid_luns</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>List of disks:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bus 0 Enclosure 0 Disk 0</td>
</tr>
<tr>
<td>Bus 0 Enclosure 0 Disk 1</td>
</tr>
<tr>
<td>Bus 0 Enclosure 0 Disk 7</td>
</tr>
<tr>
<td>Bus 0 Enclosure 0 Disk 8</td>
</tr>
<tr>
<td>Bus 0 Enclosure 0 Disk 9</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>List of luns:</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 1 2 3</td>
</tr>
</tbody>
</table>

| Max Number of disks: 16 |
| Max Number of luns: 32  |

| Raw Capacity (Blocks): 343391320 |
| Logical Capacity (Blocks): 274713056 |

| Free Capacity (Blocks, non-contiguous): 266324448 |

| Free contiguous group of unbound segments: 266324448 |

| Defrag/Expand priority: Medium |
| Percent defragmented: 100      |
| Percent expanded: 100          |

| Disk expanding onto: N/A       |

| Defrag/Expand priority: Medium |
| Percent defragmented: 100      |
| Lun Expansion enabled: NO      |

| Legal RAID types: r5           |

- Raid Group Identification Number.
- Raid type.
- Valid states are Invalid, Explicit_Remove, Valid_luns, Expanding, Defragmenting, Halted, and Busy.
- Disks used in the Raid Group.
- LUNs currently in RAID Group.
- Max disks allowed in RAID Group.
- Max LUNs allowed in storage system
- Raw capacity in disk blocks.
- Logical capacity in blocks.
- Free (unbound and non-contiguous) capacity of RAID Group in blocks.
- Displays free contiguous group of unbound segments in blocks.
- May be High, Medium, or Low.
- Percent complete of defragmenting.
- Displays if lun expansion enabled for this RAID Group.
- Displays disks expanding onto or N/A for not expanding.
- Whether LUN expansion is enabled for this RAID Group.
- Displays legal RAID types for luns to be bound on the RAID Group.
### Storage Group Information (Similar to That Returned by storagegroup -list)

<table>
<thead>
<tr>
<th>Storage Group Name:</th>
<th>Group1</th>
<th>User defined Storage Group name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Storage Group UID:</td>
<td>28:D0:64:D0:BF:90:D5:11:80:1D:08:00:1B:41:07:5B</td>
<td>32-byte unique identification number.</td>
</tr>
<tr>
<td>HBA/SP Pairs:</td>
<td></td>
<td>HBA UID, SP, and SP Port of Storage Group</td>
</tr>
<tr>
<td>HBA UID</td>
<td>SP Name</td>
<td>SPPort</td>
</tr>
<tr>
<td>20:00:00:00:C9:20:E2:1C:10:00:00:00:C9:20:E2:1C</td>
<td>SP B</td>
<td>1</td>
</tr>
<tr>
<td>HLU/ALU Pairs:</td>
<td></td>
<td>Host LUN number (HLU) and actual LUN number (ALU).</td>
</tr>
<tr>
<td>HLU Number</td>
<td>ALU Number</td>
<td></td>
</tr>
<tr>
<td>0</td>
<td>11</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>12</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>Shareable:</td>
<td>NO</td>
<td>YES or NO</td>
</tr>
</tbody>
</table>
**SnapView Information from -snapviews Switch (Same as Returned by Commands snapview -listsnapableluns, -listsessions, and -listsnapshots)**

<table>
<thead>
<tr>
<th>Snapview Information</th>
<th>*** List of LUNs that can be snapped***</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name</td>
<td>LUN n</td>
</tr>
<tr>
<td></td>
<td>List of LUN numbers for every LUN that can be a source LUN</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Name of the session:</th>
<th>sess4_5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of read requests serviced by the Reserved LUN Pool:</td>
<td>Number</td>
</tr>
<tr>
<td>Total number of read requests on the snapview logical unit:</td>
<td>Numbers</td>
</tr>
<tr>
<td>Number of reads from the TLU:</td>
<td>Number</td>
</tr>
<tr>
<td>Number of write requests in the session:</td>
<td>Number</td>
</tr>
<tr>
<td>Number of write requests to Reserved LUN Pool that triggered a COW:</td>
<td>Number</td>
</tr>
<tr>
<td>Total number of writes requests on the snapview target logical unit:</td>
<td>Number</td>
</tr>
<tr>
<td>Number of write requests larger than the chunk size:</td>
<td>Number</td>
</tr>
<tr>
<td>List of Target Logical Units:</td>
<td>LUN 4 LUN 5</td>
</tr>
<tr>
<td>snap Logical Units Name:</td>
<td>LUN name</td>
</tr>
<tr>
<td>snap Logical Units UID:</td>
<td>32-byte unique ID</td>
</tr>
<tr>
<td>Session in simulation:</td>
<td>YES, NO, or Not Supported</td>
</tr>
<tr>
<td>Session in persistence:</td>
<td>YES or NO</td>
</tr>
<tr>
<td>Session creation time:</td>
<td>Date and Time</td>
</tr>
</tbody>
</table>

The following items display for every snapshot, active or inactive

<table>
<thead>
<tr>
<th>*** Info of SnapView Snapshots ***</th>
</tr>
</thead>
<tbody>
<tr>
<td>SnapView logical unit name:</td>
</tr>
<tr>
<td>LUN name</td>
</tr>
</tbody>
</table>
Snaphview logical unit ID: 
60:06:01:60:16:64:08:00:10:54:78:F7:7B:E4:D7:11

Target Logical Unit: 4
State:

*** Info of Reserved SnapView Sessions and Snapshots ***
Session Name: SANCopy_isco2to12
Target Logical Unit: 2
SnapView logical unit name: SANCopy_isco2to12

Example  naviseccli -h ss1_spa getall
Output  See above.
Basic Commands

getarrayuid (FC4700-Series and later)

Get the storage-system unique ID

**Description**
The `naviseccli` or `navicli 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**
For `naviseccli`, you must have a user account on the storage system on which you want to execute the command.

For `navicli`, you must be able to log in to the host running Navisphere CLI.

**Format**
`getarrayuid` is used with `naviseccli` (described on page 2-6) or `navicli` (described on page 2-20) 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.

**Example**
`naviseccli -h ss1_spa getarrayuid`

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

To use this command with `navicli`, replace `naviseccli` with `navicli`.

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

Determine 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. The `navicli getatf` also displays any current trespassed or failed over LUN information.

If you are running a VMware ESX Server and you are issuing this command from a virtual machine (VM), please note this command requires the Navisphere Host Agent which is not supported on a VM. The Navisphere Host Agent is only supported on the ESX Server console.

**User Access**
You must be able to log in to the host running Navisphere CLI.

**Format**
`getatf` is used with `navicli` (described on page 2-20) as follows:

```
getatf
```

**Conventions and Recommendations**
None

**Example**
On any UNIX or Windows storage-system server:

```
navicli 1 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 `navisecli` or `navicli 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**

For `navisecli`, you must have a user account on the storage system on which you want to execute the command.

For `navicli`, you must be able to log in to the host running Navisphere CLI.

**Format**

`getcache` is used with `navisecli` (described on page 2-6) or `navicli` (described on page 2-20) as follows:

```
```

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.

-hacv (CX-series storage systems only)

Checks whether the HA cache vault is enabled or disabled. HA cache vault determines the availability of storage-system write caching when a single drive in the cache vault fails. When the HA cache vault is enabled, write caching is disabled if a single vault disk fails. When disabled, write caching is not disabled if a single disk fails.

-high

Returns the write cache high watermark. The high watermark is the percentage of dirty pages, which, when reached, causes the SP to begin flushing the cache.

-low

Returns the write cache low watermark. The low watermark is the percentage of cache dirty pages that determines when cache flushing stops. When the write cache low watermark is reached during a flush operation, the SP stops flushing the cache.

-mirror

Returns the write cache mirrored status. Always enabled for fibre.
**Basic Commands**

- **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.

-wst

Returns the current internal state of the storage system’s write cache.

-wsz

Returns the write cache size for the storage systems (which are always equal).

**Conventions and Recommendations**

None

**Example**

```
naviseccli -h ss1_spa getcache
```

To use this command with navicli, replace naviseccli with navicli.
Output

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

<table>
<thead>
<tr>
<th>SP Read Cache State</th>
<th>Enabled</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPA Write Cache State</td>
<td>Disabled</td>
</tr>
<tr>
<td>SPB Write Cache State</td>
<td>Disabled</td>
</tr>
<tr>
<td>Cache Page size:</td>
<td>2</td>
</tr>
<tr>
<td>Write Cache Mirrored:</td>
<td>YES</td>
</tr>
<tr>
<td>Low Watermark:</td>
<td>60</td>
</tr>
<tr>
<td>High Watermark:</td>
<td>90</td>
</tr>
<tr>
<td>SPA Cache pages:</td>
<td>0</td>
</tr>
<tr>
<td>SPB Cache pages:</td>
<td>0</td>
</tr>
<tr>
<td>Unassigned Cache Pages:</td>
<td>0</td>
</tr>
<tr>
<td>Read Hit Ratio:</td>
<td>0</td>
</tr>
<tr>
<td>Write Hit Ratio:</td>
<td>0</td>
</tr>
<tr>
<td>Prct Dirty Cache Pages =</td>
<td>0</td>
</tr>
<tr>
<td>Prct Cache Pages Owned =</td>
<td>0</td>
</tr>
<tr>
<td>SPA Read Cache State</td>
<td>Enabled</td>
</tr>
<tr>
<td>SPB Read Cache State</td>
<td>Enabled</td>
</tr>
<tr>
<td>SP Write Cache State</td>
<td>Disabled</td>
</tr>
<tr>
<td>SPS Test Day:</td>
<td>Friday</td>
</tr>
<tr>
<td>SPS Test Time:</td>
<td>14:00</td>
</tr>
<tr>
<td>SP A Physical Memory</td>
<td>128</td>
</tr>
<tr>
<td>SP B Physical Memory</td>
<td>128</td>
</tr>
<tr>
<td>SP A Free Memory</td>
<td>72</td>
</tr>
<tr>
<td>SP B Free Memory</td>
<td>72</td>
</tr>
<tr>
<td>SPA Read Cache Size =</td>
<td>62</td>
</tr>
<tr>
<td>SPB Read Cache Size =</td>
<td>64</td>
</tr>
<tr>
<td>SPA Write Cache Size =</td>
<td>0</td>
</tr>
<tr>
<td>SPB Write Cache Size =</td>
<td>0</td>
</tr>
<tr>
<td>SPA Optimized Raid 3 Memory Size =</td>
<td>12</td>
</tr>
<tr>
<td>SPB Optimized Raid 3 Memory Size =</td>
<td>12</td>
</tr>
</tbody>
</table>
Basic Commands

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 CLARVOiANT `systemconfig` command.)

**User Access**
For `navisecli`, you must have a user account on the storage system on which you want to execute the command.

For `navicli`, you must be able to log in to the host running Navisphere CLI.

**Format**
`getconfig` is used with `navisecli` (described on page 2-6) or `navicli` (described on page 2-20) as follows:

```
```

where

- `-ptype`
  Displays the storage-system package type.

- `-que`
  Displays the setting on how queue full status is handled. `Yes` means that the FLARE software will return device status to the operating system as busy, instead of queue full, when the device queue is full.

- `-rer`
  Displays the number of recovered errors.

- `-tn`
  Displays the state of the Target Negotiate bit.

- `-pg8`
  Displays SCSI mode page 8 information.

- `-rep`
  Displays periodic error report information: the number of reported errors or N/A.
Conventions and Recommendations

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

Example

```
naviseccli -h ssl spa getconfig
```

Sub-System Package Type: 20
Queue Full Status: DISABLED
Recovered Errors: DISABLED
Target Negotiate: Unknown
Mode Page 8: DISABLED
Periodic Error Report: N/A

To use this command with navicli, replace naviseccli with navicli.

Output

See above.
**getcontrol**

Gets SP performance information

**Description**

The `naviseccli` or `navicli getcontrol` command returns information about the SP performance.

**User Access**

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

For `navicli`, you must be able to log in to the host running Navisphere CLI.

**Format**

`getcontrol` is used with `naviseccli` (described on page 2-6) or `navicli` (described on page 2-20) as follows:

```
```

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.
Basic Commands

-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

Example
naviseccli -h ss1_spa getcontrol

To use this command with navicli, replace naviseccli with navicli.

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
<table>
<thead>
<tr>
<th>Command</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Read_requests:</td>
<td>39899771</td>
</tr>
<tr>
<td>Write_requests:</td>
<td>0</td>
</tr>
<tr>
<td>Blocks_read:</td>
<td>658341649</td>
</tr>
<tr>
<td>Blocks_written:</td>
<td>0</td>
</tr>
<tr>
<td>Sum_queue_lengths_seen_by_arrivals:</td>
<td>20009537</td>
</tr>
<tr>
<td>Arrivals_to_non_zero_queue:</td>
<td>20009537</td>
</tr>
<tr>
<td>Hw_flush_on:</td>
<td>0</td>
</tr>
<tr>
<td>Idle_flush_on:</td>
<td>0</td>
</tr>
<tr>
<td>Lw_flush_off:</td>
<td>0</td>
</tr>
<tr>
<td>Write_cache_flushes:</td>
<td>0</td>
</tr>
<tr>
<td>Write_cache_blocks_flushed:</td>
<td>0</td>
</tr>
<tr>
<td>Internal bus 1 busy ticks:</td>
<td>4294967295</td>
</tr>
<tr>
<td>Internal bus 1 idle ticks:</td>
<td>4294967295</td>
</tr>
<tr>
<td>Internal bus 2 busy ticks:</td>
<td>0</td>
</tr>
<tr>
<td>Internal bus 2 idle ticks:</td>
<td>0</td>
</tr>
<tr>
<td>Internal bus 3 busy ticks:</td>
<td>0</td>
</tr>
<tr>
<td>Internal bus 3 idle ticks:</td>
<td>0</td>
</tr>
<tr>
<td>Internal bus 4 busy ticks:</td>
<td>0</td>
</tr>
<tr>
<td>Internal bus 4 idle ticks:</td>
<td>0</td>
</tr>
<tr>
<td>Internal bus 5 busy ticks:</td>
<td>0</td>
</tr>
<tr>
<td>Internal bus 5 idle ticks:</td>
<td>0</td>
</tr>
<tr>
<td>Controller&gt; busy ticks:</td>
<td>136230</td>
</tr>
<tr>
<td>Controller idle ticks:</td>
<td>16461120</td>
</tr>
</tbody>
</table>
getcrus

Gets CRU state information

Description

The naviseccli or navicli 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.)

If one of the LCCs is pulled from Bus x, Enclosure x, all data along that bus (after the LCC was pulled) appears as faulted since the Agent cannot gather any information along that path. If this occurs, issue the getcrus command to the peer SP. The CLI lists the faulted components.

User Access

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

For navicli, you must be able to log in to the host running Navisphere CLI.

Format

getcru is used with naviseccli (described on page 2-6) or navicli (described on page 2-20) as follows:


The optional switches are

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

- **cablingsspa**
  
  Returns the cabling status for SPS A (standby power supply A).

- **cablingsspb**
  
  Returns the cabling status for SPS B (standby power supply B).
-cachecard (AX-Series [single-SP] only)

Returns the hardware state information of the cache memory card. The following table lists the possible hardware states. See also the luncache command.

<table>
<thead>
<tr>
<th>Hardware State</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>OK</td>
<td>The power on the main SP is on and the cache memory card battery is fully charged. The cache memory card is in normal operation.</td>
</tr>
<tr>
<td>Not present</td>
<td>The cache memory card is not present.</td>
</tr>
<tr>
<td>Faulted</td>
<td>The cache memory card has hardware faults.</td>
</tr>
<tr>
<td>Battery charging</td>
<td>The power on the main SP is on and the battery is charging on the cache memory card.</td>
</tr>
<tr>
<td>In wrong array</td>
<td>The cache memory card is from the wrong storage system.</td>
</tr>
</tbody>
</table>

-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.
### Basic Commands

- **-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** | **-lccreb** (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 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.
Basic Commands

-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:

<table>
<thead>
<tr>
<th>VSC state</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>Present</td>
<td>Operating normally.</td>
</tr>
<tr>
<td>Empty</td>
<td>Failed or removed before the agent started running.</td>
</tr>
<tr>
<td>Not Connected</td>
<td>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.</td>
</tr>
<tr>
<td>Removed</td>
<td>Not present when the agent was started.</td>
</tr>
</tbody>
</table>

Conventions and Recommendations

None

Example

naviseccli -h ss1_spa getcrus

To use this command with navicli, replace naviseccli with navicli.
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 a CX-Series or FC4700-Series system includes the bus number, 0 or 1, for each enclosure.
getdisk

*Gets disk status*

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

**User Access**
For `navisecli`, you must have a user account on the storage system on which you want to execute the command.
For `navicli`, you must be able to log in to the host running Navisphere CLI.

**Format**
`getdisk` is used with `navisecli` (described on page 2-6) or `navicli` (described on page 2-20) as follows:

```
```

The optional switches are:

- **disk-position**
  Returns status for a specific disk.
  
  For a storage system with Fibre Channel disks:
  `disk-position` 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).
  - `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 2-12.

  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

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

### 20-Slot Chassis

<table>
<thead>
<tr>
<th>SCSI Bus</th>
<th>Disk Position</th>
<th>Disk ID</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>0, 1, 2, 3</td>
<td>A0, A1, A2, A3</td>
</tr>
<tr>
<td>B</td>
<td>0, 1, 2, 3</td>
<td>B0, B1, B2, B3</td>
</tr>
<tr>
<td>C</td>
<td>0, 1, 2, 3</td>
<td>C0, C1, C2, C3</td>
</tr>
<tr>
<td>D</td>
<td>0, 1, 2, 3</td>
<td>D0, D1, D2, D3</td>
</tr>
<tr>
<td>E</td>
<td>0, 1, 2, 3</td>
<td>E0, E1, E2, E3</td>
</tr>
</tbody>
</table>

### 10-Slot Chassis

<table>
<thead>
<tr>
<th>SCSI Bus</th>
<th>Disk Position</th>
<th>Disk ID</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>0, 1, 2, 3, 4</td>
<td>A0, A1, A2, A3, A4</td>
</tr>
<tr>
<td>B</td>
<td>0, 1, 2, 3, 4</td>
<td>B0, B1, B2, B3, B4</td>
</tr>
</tbody>
</table>

When the *disk-position* is not entered, `getdisk` reports on all disks, regardless of which switches are set. To obtain only the information specified by the optional switches, you must include `disk-position` in the `getdisk` command.

**-bind**

Returns the percentage of the disk that is bound.
Basic Commands

-bndcrs
Returns the number of Stripe Boundary Crossings (string value or Unknown). (This switch replaces the CLARVoiiANT diskstat command.)

-busyticks
Returns the amount of time that this disk is busy.

-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.

-drivetype
Returns the drive type of the disk as Fibre Channel or ATA.

-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 3-99.

-hw
Returns the total number of hard write errors for all the disk modules in the LUN that persisted through all the retries. A growing number of hard errors may mean that one or more of the LUN’s disk modules is nearing the end of its useful life.

-idleticks
Returns the amount of time that this disk is idle.
Basic Commands

- **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 the offset of every partition on the disk.

- **product**
  Returns the product ID of the disk.

- **rb**
  Returns the percentage of the disk that is rebuilt.

- **read**
  Returns the total number of read requests made to the disk module. You might find the LUN read information in `getlun` more useful because it is for the entire LUN, and not just for one of the disk modules in the LUN.

- **rds**
  Returns the number of read requests.

- **rev**
  Returns the product revision number of the disk.

- **rg**
  Returns the RAID Group (if any) associated with this disk.

- **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.

-tla
Returns the CLARiiON TLA part number.

-type
Returns the RAID type of the disk.

-usercapacity
Returns the amount of space on the disk that is assigned to bound LUNs.

-vendor
Returns the vendor ID of the disk.

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

**-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:

<table>
<thead>
<tr>
<th>State</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>Binding</td>
<td>Being bound into a LUN.</td>
</tr>
<tr>
<td>Empty</td>
<td>Failed or removed <em>before</em> the agent started running, or the disk wasn’t part of a LUN.</td>
</tr>
<tr>
<td>Enabled</td>
<td>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.</td>
</tr>
<tr>
<td>Equalizing</td>
<td>Data from a hot spare is being copied onto a replacement disk module.</td>
</tr>
<tr>
<td>Expanding</td>
<td>Disk is being added to a RAID Group.</td>
</tr>
<tr>
<td>Failed</td>
<td>Powered down or inaccessible.</td>
</tr>
<tr>
<td>Formatting</td>
<td>Being hardware formatted. Generally, modules do not need formatting.</td>
</tr>
<tr>
<td>Off</td>
<td>Powered off by the SP, which can happen if a wrong size module is inserted.</td>
</tr>
<tr>
<td>Powering Up</td>
<td>Power is being applied to the disk module.</td>
</tr>
<tr>
<td>Ready</td>
<td>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 <em>not</em> owned by the SP that you are using as the communication channel to the chassis. If the disk module is part of a LUN assigned to an SP other than the one you are using as the communication channel, 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.</td>
</tr>
</tbody>
</table>
Examples

`naviseccli -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.

To use this command with `navicli`, replace `naviseccli` with `navicli`.

Output

<table>
<thead>
<tr>
<th>State</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rebuilding</td>
<td>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.</td>
</tr>
<tr>
<td>Removed</td>
<td>Removed from the chassis; applies only to a disk module that is part of a LUN.</td>
</tr>
<tr>
<td>Hot Spare Ready</td>
<td>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.</td>
</tr>
<tr>
<td>Unbound</td>
<td>Ready to be bound into a LUN.</td>
</tr>
<tr>
<td>Unformatted</td>
<td>Disk is unformatted.</td>
</tr>
<tr>
<td>Unsupported</td>
<td>Disk is unsupported.</td>
</tr>
</tbody>
</table>

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
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)
```
Basic Commands

Capacity: 37180
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 Boundary Crossing: 0

Statistics logging is disabled.
Certain fields are not printed if statistics logging is not enabled.
Basic Commands

getlog

Gets an SP or Event Monitor log

Description
The *naviseccli* or *navicli 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 FC4700-Series and later storage systems, 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
For *naviseccli*, you must have a user account on the storage system on which you want to execute the command.

For *navicli*, you must be able to log in to the host running Navisphere CLI.

Format
*getlog* is used with *naviseccli* (described on page 2-6) or *navicli* (described on page 2-20) 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).
### Basic Commands

#### `-fe ecode-value`

Displays the filtered log based on Extended Status Code `ecode-value`. It is not supported on CX-Series or FC4700-Series. (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

---

### Example

```
naviseccli -h ssl_spa getlog -3
```

```
04/10/1999 12:43:01 SP B(6e5) (FE Fibre loop operational)[0x00] 0 0
04/10/1999 12:43:19 SP B(6e4) (FE Fibre loop down) [0x03] 0 0
04/10/1999 12:43:19 SP B(6e5) (FE Fibre loop operational)[0x00] 0 0
```

---

To use this command with `navicli`, replace `naviseccli` with `navicli`.

### Output

See above.
getloop

Gets fibre loop information

This command applies only to Fibre Channel storage systems.

Description
The naviseccli or navicli getloop command returns information about the fibre loop.
This command is not valid for IRIX hosts.

User Access
For naviseccli, you must have a user account on the storage system on which you want to execute the command.
For navicli, you must be able to log in to the host running Navisphere CLI.

Format
getloop is used with naviseccli (described on page 2-6) or navicli (described on page 2-20) as follows:


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.
Basic Commands

Conventions and Recommendations

None

Example

**navisecli -h ss1_spa getloop**

- Has Data Loop Failed Over: NO
- Can This SP Failover: NO
- Private Loop Enabled: YES
- Illegal Cross Loop: NO
- Connection #0: Enclosure 0
- Connection #1: Enclosure 1
- Connection #2: Enclosure 2

To use this command with **navicli**, replace **navisecli** with **navicli**.

Output

See above.
Basic Commands

getlun

Gets LUN information

Description

The naviseccli or navicli getlun command returns information about a LUN and the customer replaceable units (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).

If the target LUN is a metaLUN, EMC recommends that you use the metlun -list command (see page 5-15) instead of the getlun command to return information about the metaLUN. If you use the getlun command, only the following fields report data that apply to metaLUNs — Name, Current owner, Default owner, LUN Capacity (Megabytes), LUN Capacity (Blocks), UID, Is Private, Snapshot List, MirrorView Name if any.

If you target the LUNs that make up a metaLUN, all fields apply.

User Access

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

For navicli, you must be able to log in to the host running Navisphere CLI.

Format

getlun is used with naviseccli (described on page 2-6) or navicli (described on page 2-20) as follows:

Basic Commands

[-was] [-wc] [-wch*] [-wh*] [-whist*] [-wr*] [-writes**]

where

lun-number

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.

-busyticks

Returns the amount of time that the disks on this LUN are busy.
-bwrite**
    Returns the number of blocks written for each CRU.
-capacity
    Returns, in 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.
-drivetype
    Returns the drive type of the LUN as Fibre Channel or ATA.
-dsa
    Dispalys the status of Dual Simultaneous Access (dsa).
-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.)
Basic Commands

- **idle**
  Returns the percentage of time that the disks within the LUN are idle.

- **idleticks**
  Returns the amount of time that the disks on this LUN are idle.

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

- **ismetalun**
  Returns information about whether or not the LUN is a metaLUN.

- **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.

- **luncache** (CX-Series or AX-Series only)
  Returns LUN offline (cache dirty) condition information for the specified LUN. See also the `luncache` command.

- **mirrorname**
  Returns the MirrorView mirror name.

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

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

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

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

-offset

Returns the alignment offset, assigned when the LUN was bound. Refer to the bind - offset switch.

-owner

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

-pd

Returns, in blocks, the prefetch disable size. The prefetch disable size is the size of the smallest read request for which prefetching is disabled.

-pic

Returns the maximum number of I/Os that can be outstanding to the unit and have the unit still perform prefetching.

-prb

Returns the percentage of the LUN that is rebuilt.

-prefetch

Returns the prefetch type that the LUN is using for read caching. The possible output follows.

- Variable length prefetching YES
- Constant length prefetching YES
- Prefetching: NO

-prf

Returns the percentage of read requests that caused a flush.

-ps

Returns the number of blocks of data prefetched for one host read request for constant-length prefetching. The prefetch size must be equal to or greater than the segment size. Ranges from 0 to 8192.

-private

Returns information on all private LUNs in the storage system. Supported on FC4700 and CX-Series systems.

-psm

Returns the variable prefetch size. The variable prefetch size is determined by multiplying the size of the read request, in blocks, by the multiplier. For example, if the prefetch multiplier is set to 4
and the amount of data requested is 2 Kbytes (4 disk blocks), then
the variable prefetch size is 4 times 2 Kbytes or 8 Kbytes (16 disk
blocks).

-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.)
(For pre-FC4700 storage systems.)

-reads**
Returns the number of reads received for each CRU.

-remap**
Returns the number of remapped sectors. Not supported on
CX-Series systems.
Basic Commands

- **ret**
  Returns the priority for retaining prefetched data when the read cache becomes full. If the value returned is YES, prefetched data has priority over host-requested data. If the value returned is NO, both data types have the same priority.

- **rg**
  Returns the RAID Group ID.

- **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.

- **sc**
  Returns the LUN capacity as stripe count.

- **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 lun cachestat 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 constant-length prefetch operation. For constant-length prefetching, -ss returns the segment size (in blocks) of data prefetched in one read operation from the LUN.

-ssm

Returns the prefetch segment size/multiplier; that is, the size of the segments that make up a prefetch operation. For variable-length prefetching, -ssm returns the multiplier which determines the amount of data, relative to the amount of requested data prefetched in one read operation. For example, if the segment multiplier is 4, the segment size is 4 times the amount of data requested.

-state

Returns the state of the LUN. Valid states are: Expanding, Defragmenting, Faulted, Transitioning, or bound.

-status (AX-Series and CX-Series only)

Returns the state of the Device Map for a specified LUN. The Device Map stores the configuration information about all the replication software in the storage system that is associated with the LUN.

-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 luncaheshat command.)

-**-type**

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

-**-uid**

Returns the LUN unique ID.

-**-upb**

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

-**-usage**

Returns the usage for a private LUN. Supported on FC4700 and CX-Series systems. For standard LUNs the usage displays as Unknown.

-**-verify**

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

-**-was**

Returns the minimum block size request that bypasses cache.

-**-wc**

Returns the LUN’s write cache state (enabled or disabled).

-**-wch**

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

-**-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 writes 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 writes, the second contains the number of 2-3 block writes, the third contains the number of 4-7 block writes, and so on. **whist** also displays the write histogram overflows, which are the number of writes that were larger than 512 blocks.

-**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.

None

Examples

This example retrieves the LBA (logical block address), LUN capacity, and alignment offset information:

```
navisecli -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
```

This example retrieves information about LUN number 13:

```
navisecli -h ss1_spa getlun 13
```
(See sample listing following)

To use this command with navicli, replace naviseccli with navicli.

**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
Basic Commands

<table>
<thead>
<tr>
<th>Metric</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>LUN Capacity (Blocks)</td>
<td>2097152</td>
</tr>
<tr>
<td>UID</td>
<td>60:06:01:FD:26:60:00:00:</td>
</tr>
<tr>
<td>Enclosure 0 Disk 0 Queue Length</td>
<td>0</td>
</tr>
<tr>
<td>Enclosure 0 Disk 1 Queue Length</td>
<td>0</td>
</tr>
<tr>
<td>Enclosure 0 Disk 7 Queue Length</td>
<td>0</td>
</tr>
<tr>
<td>Enclosure 0 Disk 8 Queue Length</td>
<td>0</td>
</tr>
<tr>
<td>Enclosure 0 Disk 9 Queue Length</td>
<td>0</td>
</tr>
<tr>
<td>Enclosure 0 Disk 1 Hard Read Errors</td>
<td>0</td>
</tr>
<tr>
<td>Enclosure 0 Disk 7 Hard Read Errors</td>
<td>0</td>
</tr>
<tr>
<td>Enclosure 0 Disk 8 Hard Read Errors</td>
<td>0</td>
</tr>
<tr>
<td>Enclosure 0 Disk 9 Hard Read Errors</td>
<td>0</td>
</tr>
<tr>
<td>Enclosure 0 Disk 0 Hard Write Errors</td>
<td>0</td>
</tr>
<tr>
<td>Enclosure 0 Disk 1 Hard Write Errors</td>
<td>0</td>
</tr>
<tr>
<td>Enclosure 0 Disk 7 Hard Write Errors</td>
<td>0</td>
</tr>
<tr>
<td>Enclosure 0 Disk 8 Hard Write Errors</td>
<td>0</td>
</tr>
<tr>
<td>Enclosure 0 Disk 9 Hard Write Errors</td>
<td>0</td>
</tr>
<tr>
<td>Enclosure 0 Disk 0 Soft Read Errors</td>
<td>0</td>
</tr>
<tr>
<td>Enclosure 0 Disk 1 Soft Read Errors</td>
<td>0</td>
</tr>
<tr>
<td>Enclosure 0 Disk 7 Soft Read Errors</td>
<td>0</td>
</tr>
<tr>
<td>Enclosure 0 Disk 8 Soft Read Errors</td>
<td>0</td>
</tr>
<tr>
<td>Enclosure 0 Disk 9 Soft Read Errors</td>
<td>0</td>
</tr>
<tr>
<td>Enclosure 0 Disk 0 Soft Write Errors</td>
<td>0</td>
</tr>
<tr>
<td>Enclosure 0 Disk 1 Soft Write Errors</td>
<td>0</td>
</tr>
<tr>
<td>Enclosure 0 Disk 7 Soft Write Errors</td>
<td>0</td>
</tr>
<tr>
<td>Enclosure 0 Disk 8 Soft Write Errors</td>
<td>0</td>
</tr>
<tr>
<td>Enclosure 0 Disk 9 Soft Write Errors</td>
<td>0</td>
</tr>
<tr>
<td>Bus 0 Enclosure 0 Disk 0 Enabled</td>
<td>0</td>
</tr>
<tr>
<td>Bus 0 Enclosure 0 Disk 1 Enabled</td>
<td>0</td>
</tr>
<tr>
<td>Bus 0 Enclosure 0 Disk 7 Enabled</td>
<td>0</td>
</tr>
<tr>
<td>Bus 0 Enclosure 0 Disk 8 Enabled</td>
<td>0</td>
</tr>
<tr>
<td>Bus 0 Enclosure 0 Disk 9 Enabled</td>
<td>0</td>
</tr>
<tr>
<td>Is Private:</td>
<td>NO</td>
</tr>
</tbody>
</table>

Usage:
- Mirrored Name if any: Not Mirrored
**getresume**

**Description**

The naviseccli or navicli getresume command displays the information stored in the resume PROM for the enclosure display board, link control card (LCC), power supply, SP, or SAN personality card.

**User Access**

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

For navicli, you must be able to log in to the host running Navisphere CLI.

**Format**

getresume is used with naviseccli (described on page 2-6) or navicli (described on page 2-20) as follows:

```
getresume [-sp sp] [-pc] [-mp] [-lcc busNumber enclosureNumber [lcca | lccb]] [-ps busNumber enclosureNumber | xpe [psa | psb]]
```

The optional switches are:

- **-sp sp**
  
  Displays information stored in the resume PROM for the SP.

- **-pc**
  
  Displays information stored in the resume PROM for the SAN personality card.

- **-mp**
  
  Displays information stored in the resume PROM for the enclosures.

- **-lcc busNumber enclosureNumber [lcca | lccb]**
  
  Displays information stored in the resume PROM for the link control card. If you omit -lcca or -lccb, information is returned for link control cards A and B.

- **-ps busNumber enclosureNumber | xpe [psa | psb]**
  
  Displays information stored in the resume PROM for the power supply. If you omit -psa or -psb, information is returned for power supplies A and B.
**Basic Commands**

**Conventions and Recommendations**

None.

**Example**

```
navicli -h ss1_spa getresume -ps 0 1
```

This example displays information stored in the resume PROM for power supplies A and B (bus 0, enclosure 1).

To use this command with navicli, replace naviseccli with navicli.

**Output**

```
Bus 0 Enclosure 1
Power A
  EMC Part Number     118032322
  EMC Artwork Revision 000
  EMC Assembly Revision A03
  EMC Serial Number   AC115040501930
  Vendor Part Number  API2SG02-710
  Vendor Assembly Number M02
  Vendor Serial Number AC1040501930
  Vendor Name         ACBEL POLYTECH INC.
  Location of Manufacture Apex, NC USA
  Year of Manufacture  2004
  Month of Manufacture  02
  Day of Manufacture    13
  Assembly Name        12V P/S w/BWR, RPWR
  Programmable Name    N/A
  Programmable Revision N/A

Bus 0 Enclosure 1
Power B
  EMC Part Number     118032322
  EMC Artwork Revision 000
  EMC Assembly Revision A03
  EMC Serial Number   AC115040501699
  Vendor Part Number  API2SG02-710
  Vendor Assembly Number M02
  Vendor Serial Number AC1040501699
  Vendor Name         ACBEL POLYTECH INC.
  Location of Manufacture Apex, NC USA
  Year of Manufacture  2004
  Month of Manufacture  02
  Day of Manufacture    13
```
<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assembly Name</td>
<td>12V P/S w/BWR, RPWR</td>
</tr>
<tr>
<td>Programmable Name</td>
<td>N/A</td>
</tr>
<tr>
<td>Programmable Revision</td>
<td>N/A</td>
</tr>
</tbody>
</table>
getrg (RAID Group)

Gets RAID Group information

Description
The naviseccli or navicli 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
For naviseccli, you must have a user account on the storage system on which you want to execute the command.

For navicli, you must be able to log in to the host running Navisphere CLI.

Format
getrg is used with naviseccli (described on page 2-6) or navicli (described on page 2-20) as follows:


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.

-drivetype
Returns information about whether the RAID Group consists of Fibre Channel or ATA drives.

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

-hotspare
Returns the RAID Group number that has the faulted disks for which the hot spare is replacing.
-legal
Returns information about 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 NO for not expanding.

-lunlist
Returns a list of LUNs that are currently in the RAID Group.

-lusc
Returns a free contiguous group of unbound segments in blocks.

-maxd
Returns the maximum number of disks that are allowed in the RAID Group.

-maxl
Returns the maximum number of LUNs that are allowed in the RAID Group.

-pod
Returns the priority of defragmentation/expansion operations. Valid values are high, medium, low, or N/A.

-prcntdf
Returns the percent of defragmentation 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.

Example
```
naviseccli -h ss1_spa 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 (Not supported on AX-Series)

Gets background verify reports

Description
The naviseccli or navicli getsniffer command retrieves background verify reports. You can retrieve reports for a specific LUN, all LUNs in a RAID Group, or all LUNs in a storage system.

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

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

For navicli, you must be able to log in to the host running Navisphere CLI.

Format
getsniffer is used with naviseccli (described on page 2-6) or navicli (described on page 2-20) as follows:


where

-all
Specifies to retrieve reports on all luns in the storage system, owned by the target SP.

When you specify the -all switch, it may generate a sizeable amount of data and take a considerable amount of time to generate the data.

lun

Specifies the logical unit on which to report. lun specifies the logical unit number (0-31 for non-RAID Group storage systems, 0-222 for FC4700 storage systems and 0-1023 for CX-Series storage systems).

-rg raidgroupnumber

Specifies to retrieve reports on all LUNs in the RAID Group, owned by the target SP.
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

Example

naviseccli -h ss1_spa getsniffer 1

Retrieves the report of the active full unit verify operation for LUN 1.

To use this command with navicli, replace naviseccli with navicli.

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)

+---------------------------------+----------------+----------------+
<table>
<thead>
<tr>
<th>Corrected</th>
<th>Uncorrectable</th>
</tr>
</thead>
<tbody>
<tr>
<td>Checksum errors</td>
<td>0</td>
</tr>
<tr>
<td>Write Stamp errors</td>
<td>0</td>
</tr>
<tr>
<td>Time Stamp errors</td>
<td>0</td>
</tr>
<tr>
<td>Shed Stamp errors</td>
<td>0</td>
</tr>
<tr>
<td>Coherency errors</td>
<td>0</td>
</tr>
</tbody>
</table>
+---------------------------------+----------------+----------------+
Currently Running Full Unit Verify

<table>
<thead>
<tr>
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<th>Uncorrectable</th>
</tr>
</thead>
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<td>0</td>
</tr>
<tr>
<td>Shed Stamp errors</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Coherency errors</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

Most Recently Completed Full Unit Verify

<table>
<thead>
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</tr>
</thead>
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<td>0</td>
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</tr>
<tr>
<td>Coherency errors</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

Historical Total of All Full Unit Verifies (0 passes)

<table>
<thead>
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<th>Corrected</th>
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<tr>
<td>Coherency errors</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>
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 FC4700-Series and later storage systems, each SP is a host (-h
switch) to which you address the command.

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

For navicli, you must be able to log in to the host running
Navisphere CLI.

**Format**
getsp is used with naviseccli (described on page 2-6) or navicli
(described on page 2-20) as follows:

```
```

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

**Example**

```bash
naviseccli -h ss1_spa getsp
```

**SP A**

- Type of Each SP: Unknown
- Signature For The SP: 147509
- Signature For The Peer SP: 135171
- Revision Number For The SP: 0.00.00
- Serial Number For The SP: N/A
- Memory Size For The SP: 930
- SP SCSI ID if Available: 0

**SP B**

- Type of Each SP: Unknown
- Signature For The SP: 135171
- Signature For The Peer SP: 147509
- Revision Number For The SP: 1.56.20
- Serial Number For The SP: A1000330
- Memory Size For The SP: 930
- SP SCSI ID if Available: 0

To use this command with `navicli`, replace `naviseccli` with `navicli`.

**Output**

See above.
**getsptime (FC4700-Series and later)**

Gets the date and time setting on each SP system clock

**Description**
The naviseccli or navicli getsptime command displays the system time set on an SP. Times are the same on SPs, since the FLARE software ensures that both SP clocks show the same time.

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

For navicli, you must be able to log in to the host running Navisphere CLI.

**Format**
getsptime is used with naviseccli (described on page 2-6) or navicli (described on page 2-20) as follows:

```bash
getsptime [-spa|-spb]
```

where

- `-spa` or `-spb`

  Specifies from which SP to display the date and time.

**Example**

```bash
naviseccli -h data1_spa getsptime -spa
```

To use this command with navicli, replace naviseccli with navicli.

**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 FLARE 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 FLARE 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 2-20) 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 2-12.

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**

Executes the command without prompting for confirmation

**Conventions and Recommendations**

None.

**Example**

```
navicli -h payroll_storage_SPA initializearray -createpsm
```

(confimation 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 FLARE 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
You must be able to log in to the host running Navisphere CLI.

Format
initializearray -list is used with navicli (described on page 2-20) 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 FLARE 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 an Event Monitor template.

**Description**

The `naviseccli` or `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**

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

For `navicli`, you must be able to log in to the host running Navisphere CLI.

**Format**

`inserttestevent` is used with `naviseccli` (described on page 2-6) or `navicli` (described on page 2-20) as follows:

`inserttestevent`

**Conventions and Recommendations**

None.

**Example**

`naviseccli -h ss1_spa inserttestevent`

For `ss1_spa`, this command writes a test event into the Event Monitor log file.

To use this command with `navicli`, replace `naviseccli` with `navicli`. 
luncache -clear (CX-Series or AX-Series only)

Clears the LUN offline (cache dirty) condition

**Description**
The `naviseccli` or `navicli luncache` command with the `-clear` function clears the LUN offline (cache dirty) condition. You can clear the LUN offline condition for a specific LUN, or for all LUNS on the storage system.

When a storage processor (SP) fails, writes destined for a LUN that have not yet been flushed to disk place the LUN in an offline (cache dirty) condition. LUNs in an offline condition are inaccessible until pending writes for the LUN are cleared.

**Important** When you execute `luncache -clear`, all pending writes on the LUN are lost.

You must issue the command to the SP that owns the LUN.

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

For `navicli`, you must have a user entry in the Navisphere agent configuration file.

**Format**
`luncache -clear` is used with `naviseccli` (described on page 2-6) or `navicli` (described on page 2-20) as follows.

```
luncache lun-number -clear [-o]
```

where

```
lun-number
```

Specifies the LUN for which to clear the LUN offline condition. If you do not specify a LUN number, clears the LUN offline condition for all LUNS on the storage system.

```
-o
```

Executes the command without prompting for confirmation.

**Conventions and Recommendations**
You can verify the offline condition of a LUN, using the `luncache -list` command.

**Example**
`naviseccli -h ss1_spa luncache 9 -clear`
Basic Commands

This command clears the LUN offline condition for the specified LUN.

Bringing the LUN online will cause all pending writes on the LUN to be lost.

Do you want to bring the LUN online now? (y/n)

To use this command with navicli, replace naviseccli with navicli.

Output

None if the command succeeds; status or error information if it fails.
luncache -list (CX-Series or AX-Series only)

Returns LUN offline (cache dirty) condition information

Description
The naviseccli or navicli luncache command with the -list function returns the LUN offline (cache dirty) condition information. You can return information for a specific LUN or for all LUNS on the storage system.

When a storage processor (SP) fails, writes destined for a LUN that have not yet been flushed to disk place the LUN in an offline (cache dirty) condition. LUNs in an offline condition are inaccessible until pending writes for the LUN are cleared.

You must issue the command to the SP that owns the LUN.

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

For navicli, anyone that can log in to the host running the Navisphere CLI.

Format
luncache -list is used with naviseccli (described on page 2-6) or navicli (described on page 2-20) as follows.

luncache lun-number -list
where
lun-number

Indicates the LUN for which to display LUN offline condition information. If you do not specify a LUN number, LUN offline condition information is returned for all LUNS on the storage system.

Conventions and Recommendations
You can clear the LUN offline condition using luncache -clear.

Example
naviseccli -h ss1_spa luncache 9 -list

This command displays LUN offline condition information for the specified LUN.

To use this command with navicli, replace naviseccli with navicli.

Output
LUN Offline (Cache Dirty Condition): YES
Basic Commands

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. You must specify a server hostname with the **-h** switch.

This is a host-based command. SP address is only needed to get LUN information related to the devices attached to the server.

If you are running a VMware ESX Server and you are issuing this command from a virtual machine (VM), please note this command requires the Navisphere Host Agent which is not supported on a VM. The Navisphere Host Agent is only supported on the ESX Server console.

User Access

You must be able to log in to the host running 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 2-20, but for the **-h** switch see the note above) as follows:

For CX-Series or FC4700-Series storage systems:

\[
\text{lunmapinfo } [-\text{update} ] [ -\text{o} ] \\
\text{or }
\text{lunmapinfo } [-\text{wwn} ] [ -\text{capacity} ] \text{sphosts }
\]

For pre-FC4700 systems:

\[
\text{lunmapinfo } [-\text{update} ] [ -\text{o} ]
\]

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.
Basic Commands

-capacity
- Displays the capacity for the LUNs.

sphosts
- Displays information for those storage systems that are managed by the hosts you specify. (Valid for FC4700 and CX-Series systems only.)

-wwn
- Displays the World Wide Name (WWN) for the LUNs.

Conventions and Recommendations

None.

Example

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 payrollsrvr lunmapinfo 12.34.567.890 12.34.567.890

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

For the server with hostname payroll_srvr these commands update the LUN mapping information, and then list the LUN information for the SPs whose IP addresses are 12.34.567.890 and 12.34.567.890 123.456.
Example for FC4500

```
navicli -h payroll_srvr 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 payroll_srvr, this lists all LUN information. It does not update the LUN mapping.

**Output**
See above.
**managedby (CX-Series or AX-Series only)**

Displays the application that manages the storage system

**Description**

The `naviseccli` or `navicli managedby` command displays whether Navisphere Manager or the Navisphere Express application manages the AX-Series storage system you specify.

You use the `managedby` command for purposes of the CLARiiON VSS Provider. The VSS Provider is used in conjunction with the SnapView functionality, to provide back-up capabilities. See the **EMC CX-Series Server Support Products for Windows Installation Guide** for information on the VSS Provider.

If Navisphere Express manages the storage system, the VSS Provider limits some actions. You can use the `managedby` command to determine whether the storage system you specify is managed by Navisphere Manager or Navisphere Express.

The command returns an output value of Navi Manager (Navisphere Manager), Navi Express (Navisphere Express), or None. A value of "None" is synonymous to Navisphere Manager.

**User Access**

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

For `navicli`, anyone that can log in to the host running the Navisphere CLI.

**Format**

`managedby` is used with `naviseccli` (described on page 2-6) or `navicli` (described on page 2-20) as follows.

`managedby`

**Conventions and Recommendations**

None.

**Example**

`naviseccli -h ss1_spa managedby`

This command displays the application that manages the AX-Series storage system specified. The storage system is managed by Navisphere Manager.

To use this command with `navicli`, replace `naviseccli` with `navicli`.

**Output**

Managed By: Navi Manager
managefiles -delete (Secure and Classic CLI version)

Deletes SP logging files on the specified storage system

**Description**
The `naviseccli` or `navicli` `managefiles` command with the `-delete` function lets you delete SP logging files from supported directories.

The dumps and logs directories are supported for `managefiles`.

You can specify the files to delete using the `-all` or `-file` switches, or you can omit switches and display a list of files, then choose a file from the list.

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

For `navicli`, you must have a user entry in the Navisphere agent configuration file.

**Format**
`managefiles -delete` is used with `naviseccli` (described on page 2-6) or `navicli` (described on page 2-20) as follows:

`managefiles -delete [-all] [-file filenames]`

where

- `-all`
  Deletes all files from the supported directory.

- `-file filenames`
  Deletes the specified files from the supported directory.

- `-o`
  Executes the command without prompting for confirmation.

**Conventions and Recommendations**
None.

**Example**
`naviseccli -h ss1_spa managefiles -delete`

This command shows you all file index numbers and names. The files appear in the format shown below.
Basic Commands

You then enter the file you want to delete, by either its index number or name.

Enter files to be deleted with index separated by comma (1,2,3,4-5) OR a range (1-3) OR enter 'all' to delete all file OR 'quit' to quit> 2

Files selected to be deleted are

naviagent_Oct-27-00_08-48-38.log

Do you want to continue(y/n)[n]? (y/n)? y

File naviagent_Oct-27-00_08-48-38.log is deleted.

To use this command with navicli, replace naviseccli with navicli.

Output

None if the command succeeds; status or error information if it fails.
managefiles -list (Secure and Classic CLI version)

Lists SP logging files in supported directories

**Description**

The naviseccli or navicli managefiles command with the -list function lets you display a list of SP logging files in supported directories.

The dumps and logs directories are supported for managefiles.

**User Access**

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

For navicli, anyone that can log in to the host running the Navisphere CLI.

**Format**

managefiles -list is used with naviseccli (described on page 2-6) or navicli (described on page 2-20) as follows:

```plaintext
managefiles -list
```

**Conventions and Recommendations**

None.

**Example**

```plaintext
naviseccli -h ss1_spa managefiles -list
```

This command shows you a list of files in the supported directories, for the storage system you specify.

To use this command with navicli, replace naviseccli with navicli.

**Output**

<table>
<thead>
<tr>
<th>Index</th>
<th>Size</th>
<th>Last Modified</th>
<th>Filename</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
<td>10/26/2000 17:39:53</td>
<td>naviagent_Oct-26-00_13-36-17.log</td>
</tr>
</tbody>
</table>
managefiles -retrieve (Secure and Classic CLI version)

Retrieves SP logging files from a remote storage system to the local system

Description
The naviseccli or navicli managefiles command with the -retrieve function lets you retrieve SP logging files from supported directories on a remote storage system to the local system.

The dumps and logs directories are supported for managefiles.

You can specify the files to retrieve using the -all or -file switches, or you can omit switches and display a list of files, then choose a file from the list.

User Access
For naviseccli, you must have a user account on the storage system on which you want to execute the command.
For navicli, you must have a user entry in the Navisphere agent configuration file.

Format
managefiles -retrieve is used with naviseccli (described on page 2-6) or navicli (described on page 2-20) as follows:

managefiles -retrieve [-path path] [-all] [-file filenames]

where

-path path
Specifies the path on the local system to copy the file to. If you do not use this switch, the file is copied to the current directory.

-all
Retrieves all files from the supported directory.

-file filenames
Retrieves the specified files from the supported directory.

-o
Executes the command without prompting for confirmation.

Conventions and Recommendations
None.
**Example**

navisecli -h ss1_spa managefiles -retrieve

This command shows you all file index numbers and names. The files appear in the format shown below.

<table>
<thead>
<tr>
<th>Index</th>
<th>Size</th>
<th>Last Modified</th>
<th>Filename</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
<td>10/26/2000 17:39:53</td>
<td>naviagent_Oct-26-00_13-36-17.log</td>
</tr>
</tbody>
</table>

You then enter the file you want to retrieve, by either its index number or name.

Enter files to be retrieved with index seperated by comma (1,2,3,4-5) OR a range (1-3) OR enter 'all' to retrieve all file OR 'quit' to quit> 2

Files selected to be retrieved are naviagent_Oct-27-00_08-48-38.log

Do you want to continue(y/n)[n]? (y/n)? y

File naviagent_Oct-27-00_08-48-38.log is retrieved to the current directory.

To use this command with navicli, replace navisecli with navicli.

**Output**

None if the command succeeds; status or error information if it fails.
**managefiles -list (Java CLI version)**

Lists SP logging files in a specified directory

**Description**
The `navicli.jar managefiles` command with the `-list` function lets you display a list of SP logging files in supported directories.

The dumps and archives directories are supported for `managefiles`.

You can specify a directory to display all files in that directory, or you can specify a file to display only that file.

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

**Format**
`managefiles -list` is used with `navicli.jar` (described on page 2-31) as follows:

```
managefiles -list [-file directory\directory\filename]
```

where

- **-file directory\directory\filename**
  Specifies a supported directory or file in a supported directory on the remote storage system. If you do not use this switch, a list of the files in the supported directories is displayed.

**Conventions and Recommendations**
None.

**Example**
`navicli.jar -address ss1_spa managefiles -list -file dumps`

This command shows you all files in the `dumps` directory. The files appear in the format shown below.

**Output**
```
dumps\gui_filter.out
dumps\pfilter-on.log
dumps\ktdump-041207-115134.txt
```
managefiles -retrieve (Java CLI version)

Retrieves SP logging files from a remote storage system to the local system

Description

The navicli.jar managefiles command with the -retrieve function lets you retrieve an SP logging file from a supported directory on a remote storage system to the local system.

The dumps and archives directories are supported for managefiles.

You can specify a file to retrieve, or you can specify a directory to display a list of files in that directory. You can then choose a file from the list by its index number or name to retrieve.

User Access

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

Format

managefiles -retrieve is used with navicli.jar (described on page 2-31) as follows:

managefiles -retrieve [-path path] [-file directory\directory\filename]

where

-path path

Specifies the path on the local system to copy the file to. If you do not use this switch, the file is copied to C:\.

-file directory\directory\filename

Specifies a supported directory or file in a supported directory on the remote storage system. If you do not use this switch, a list of the files in the supported directories is displayed.

-o

Executes the command without prompting for confirmation.

Conventions and Recommendations

None.
Example

```
navicli.jar -address ss1_spa managefiles -retrieve -path C:\ -file dumps
```

This command shows you all file index numbers and names in the `dumps` directory. The files appear in the format shown below.

<table>
<thead>
<tr>
<th>Index</th>
<th>Filename</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td><code>dumps\gui_filter.out</code></td>
</tr>
<tr>
<td>1</td>
<td><code>dumps\pfilter-on.log</code></td>
</tr>
<tr>
<td>2</td>
<td><code>dumps\ktdump-041207-115134.txt</code></td>
</tr>
</tbody>
</table>

You then enter the file you want to retrieve, by either its index number or name.

```
Enter file to be retrieved with index OR 'quit' to quit> 1
```

```
File selected to be retrieved :
dumps\pfilter-on.log
```

```
Do you want to continue (y or n)? y
```

Output

None if the command succeeds; status or error information if it fails.
ndu -list (FC4700-Series and later)

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 FLARE software or Access Logix, MirrorView, and Snapview packages.

For AX-Series storage systems the process is disruptive.

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

The ndu command is not supported on Netware and HP-UX operating systems.

Description

The navicli ndu command with the -list function and no switches displays information about all installed software packages. The format looks like this:

Name of the software package: name
Revision of the software package: n.nn
Commit Required: yes or no or already committed
Revert Possible: yes or no
Active State: yes or no
Is installation complete yes or no or not applicable.
Is this System Software: yes or no

For information on one package, use the -name switch. For a subset of package information, use one or more additional switches.

User Access

You must be able to log in to the host running Navisphere CLI.

Format

ndu -list is used with navicli (described on page 2-20) as follows:

where

**-name [name]**

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

**-gen**

Displays the generation of the package.

**-rev**

Displays the package revision.

**-iscommitable**

Displays yes if the package can be committed, no if it cannot.

**-isrevertable**

Displays yes if the package can be reverted (it is not committed), no if it cannot be.

**-isactive**

Displays yes if the package is active, no if it is not.

**-iscomplete**

Displays yes if the package file contains a complete set of files, no or not applicable if it does not.

**-issystem**

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

### Conventions and Recommendations

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

### Example

```bash
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 FLARE software running on the SP does not support this command, a **Not supported** error message is printed to `stderr`.

*ndu-list (FC4700-Series and later)* 3-155
**ndu -install** *(FC4700-Series and later)*

Transfers 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.

For AX-Series storage systems the process is disruptive.

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.

Beginning with FLARE Operating Environment version 02.19.xxx.5.yyy, when you execute `ndu -install`, the CLI performs a series of pre-installation validation checks on a CX-Series or AX-Series system, prior to installing or upgrading customer-installable software packages. Prior to issuing the install, you must satisfy the specified configuration requirements for the pre-installation validation checks functionality, or the installation will not complete. See Pre-Installation Validation Checks at the end of this section for configuration requirements.

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 FLARE software installed, then you must upgrade all three using one ndu -install command. When you install a new package of the same revision as other existing packages, you may install only that package and not the others.

The CLI takes the following actions in order:

* If it can find the packages, it transfers them without interaction.
* Unless you used -force (which prevents the prompt and is equivalent to the "all" response), the software examines each package and displays the following information for confirmation:

  | Item number: | n |
  | Name of the software package: | driver-name |
  | Revision of the software package: | n.nn |
  | Already Installed Revision: | NO or YES |
  | Installable | YES or NO |

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

  Specify the package(s) you want installed. If you make an invalid choice, the CLI does not install any package.

Do not change the configuration; for example, binding new LUNs or expanding MetaLUNs while a software install is in progress. Such operations will be rejected; delay them until after the software upgrade is complete and committed.
Pre-Installation Validation Checks
Pre-installation validation checks identify unsupported or unsafe installation conditions. You initiate the validation checks functionality when you issue the `ndu -install` command. The validation checks run in the background, prior to installing the software. If a validation check fails, the CLI displays the error and terminates the installation. You can choose to display all validation checks as the functionality executes by specifying the `-verbose` switch, otherwise the CLI only displays failures that prevent installation. The following responses exist for each validation check:

<table>
<thead>
<tr>
<th>Response</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Successful</td>
<td>Validation check is successful. Installation proceeds.</td>
</tr>
<tr>
<td>Warning</td>
<td>Conditions exist that may need correction. Installation proceeds.</td>
</tr>
<tr>
<td>Failure</td>
<td>Conditions exist that require correction before installation can proceed. Installation terminates.</td>
</tr>
</tbody>
</table>

The pre-installation validation checks identify a series of unsupported or unsafe installation conditions, but cannot guarantee a successful install.

In addition to the user access requirements for the `ndu` command, the validation checks (a Java-based functionality), has associated configuration requirements that you must follow:

- Install a JRE (see the *EMC Navisphere Manager and Manager Base Release Notes* for the correct version).
- Create the required user accounts on the storage system (see *Getting Started With Secure CLI* on page 2-3 or *Requirements for Using Java CLI* on page 2-29). You can create the user accounts using the Secure or Java CLI syntax.
- Create a security file on the host (see *Overview of Using the Navisphere 6.X Security with Java CLI* on page 2-30). You must create a security file using the Java CLI syntax. If you do not create a security file using the Java CLI syntax, the CLI prompts you for a valid username, password and scope:
Security File does not exist
Please enter security information to proceed:
   Enter User (Existing user on storage system)
   Enter Password
   Enter Scope (0 - global [default]; 1 - local)

If the storage system is uninitialized, user credential information is not required. Therefore, a security file is not required and the CLI does not prompt you for a username, password and scope.

You can also issue validation checks without installing or upgrading software (see `ndu -runrules`).

**User Access**
You must have a user entry in the Navisphere agent configuration file.

**Format**

`ndu -install` is used with `navicli` (described on page 2-20) as follows:

```
```

*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 delay`

Specifies the delay time that allows attached hosts enough time after SP B has finished rebooting to rescan and mark paths available to SP B, before SP A reboots. The minimum allowed delay is zero seconds and the maximum allowed is 1140 seconds. In most cases, the EMC recommended NDU delay of 360 seconds should be used. However, some host configurations (such as those using Veritas DMP) may require a longer delay.
Basic Commands

-force
Installs without user interaction. If any package is not installed for any reason, the software displays an error message and continues installing other packages specified in the command.

-gen
Displays the generation of the package.

-verbose
Displays all results of the pre-installation validation checks. Without this switch, only errors that prevent installation (failures) are displayed.

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 10.14.12.74 ndu -install CX400-02.07.400.3.107.lst

Item number: 0
Name of the software package: FLARE-Operating-Environment
Revision of the software package: 02.07.400.3.107
Already Installed Revision: 02.07.400.3.10
Installable YES
Disruptive upgrade: NO

The requested package(s) will be installed. Do you wish to proceed?: (y/n)? y

For the SP with hostname 10.14.12.74, this command installs the FLARE Operating Environment bundle.

Output

If the version of FLARE software running on the SP does not support this command, a Not supported error message is printed to stderr. Other error message(s):
NDU_NOT_SUPPORTED
NDU_CANNOT_FIND_FILE
NDU_CANNOT_XFER_FILE
INVALID_PACKAGE
**ndu -runrules (CX-Series or AX-Series only)**

Executes the pre-installation validation checks

**Description**
The `navicli ndu` command with the `-runrules` function executes the pre-installation validation checks, without performing software installation (see `ndu -install`).

The `ndu -runrules` command has associated configuration requirements for the pre-installation validation checks functionality. See Pre-Installation Validation Checks under `ndu -install`.

**User Access**
You must have a user entry in the Navisphere agent configuration file.

**Format**
`ndu -runrules` is used with `navicli` (described on page 2-20) as follows:

`ndu -runrules [pathlist] [-listrules] [-verbose]`

where

`pathlist`
Specifies filenames, with full pathnames, of the software packages to be committed.

`-listrules`
Displays a list of pre-installation validation checks that would run for the specified host. The validations checks do not execute. To run the validation checks, do not include this switch.

`-verbose`
Displays all results of the pre-installation validation checks. Without this switch, only errors that prevent installation (failures) are displayed.

**Conventions and Recommendations**
Use the `navicli ndu -install` command to both run the pre-installation validation checks and install software.

**Example**
`navicli -h payroll_storage_SPA ndu -runrules`
For the SP with hostname `payroll_storage_SPA`, this command executes the pre-installation validation checks.

**Output**
If the pre-installation validation checks detect failures, the failures are displayed.
**ndu -commit (FC4700-Series and later)**

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.

You cannot create any new RAID Groups or bind any new LUNs until you commit FLARE and Access Logix software.

**User Access**
You must have a user entry in the Navisphere agent configuration file.

**Format**
`ndu -commit` is used with `navicli` (described on page 2-20) as follows:

```
ndu -commit namelist
```

where

`namelist`

Lists package names 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 FLARE software running on the SP does not support this command, a `Not supported` error message is printed to `stderr`.

---

*EMC Navisphere Command Line Interface (CLI) Reference*
ndu -status (FC4700-Series and later)

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 2-20) as follows:

```bash
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 FLARE 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 2-20) as follows:

```bash
ndu -revert [-delay seconds] namelist [-o]
```

where

- **-delay seconds**
  Specifies the delay time that allows attached hosts enough time after SP B has finished rebooting to rescan and mark paths available to SP B, before SP A reboots. The minimum allowed delay is zero seconds and the maximum allowed is 1140 seconds. In most cases, the EMC recommended NDU delay of 360 seconds should be used. However, some host configurations (such as those using Veritas DMP) may require a longer delay.

- **namelist**
  Lists package names of the software packages to be reverted.

- **-o**
  Executes the command without prompting for confirmation.

**Conventions and Recommendations**

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

```bash
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 FLARE 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 (FC4700-Series and later)

Lists network name and address information

Description
The naviseccli or navicli networkadmin command -get function without switches lists all network information for an SP. Issue the command to the SP for which this information is needed.

Issuing this command with one or more switches displays the information based on the specified switch. The line Storage Processor: is always displayed. This command displays information in the following format.

Storage Processor: SP-id (A or B)
Storage Processor Network Name: SP-network-name
Storage Processor IP Address: SP-IP-address
Storage Processor Subnet Mask: SP-subnet-mask
Storage Processor Gateway Address: SP's-gateway-system address

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

For navicli, you must be able to log in to the host running Navisphere CLI.

Format
networkadmin -get is used with naviseccli (described on page 2-6) or navicli (described on page 2-20) 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 3-170.

### Example

```bash
navisecccli -h payroll_storage_SPB networkadmin -get
```

For each SP, these commands list all network information.

To use this command with `navicli`, replace `navisecccli` with `navicli`.

### Output

See previous page. If the version of FLARE software running on the SP does not support this command, a Not supported error message is printed to `stderr`. 
**networkadmin -mib (FC4700-Series and later)**

Enables and disables SNMP services on the storage system SP

**Description**
The `naviseccli` or `navicli networkadmin` command `-mib` function enables or disables the processing of SNMP MIB read requests on an SP. This command with no option lists the current status of the SNMP service.

**User Access**
For `naviseccli`, you must have a user account on the storage system on which you want to execute the command.
For `navicli`, you must have a user entry in the Navisphere agent configuration file.

**Format**

`networkadmin -mib` is used with `naviseccli` (described on page 2-6) or `navicli` (described on page 2-20) as follows:

`networkadmin -mib [-enable] [-disable] [-o]`

where

- **-enable**
  Enables the SNMP services.

- **-disable**
  Disables the SNMP services.

- **-o**
  Executes the command without prompting for confirmation.

**Conventions and Recommendations**
To discover current settings, use the `networkadmin -mib` function.

**Example**

`naviseccli -h payroll_storage_SPA networkadmin -mib -disable`

Disable processing of SNMP read requests on SP A (y/n) [n] y

For the SP with hostname `payroll_storage_SPA` this command disables the SNMP services on SP A.

To use this command with `navicli`, replace `naviseccli` with `navicli`.

---

EMC Navisphere Command Line Interface (CLI) Reference
Output

Storage Processor: SP A
SNMP MIB Status: Disabled

If the version of FLARE software running on the SP does not support this command, a Not supported error message is printed to stderr.
**networkadmin -set (FC4700-Series and later)**

Updates network information for an 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 `naviseccli` or `navicli networkadmin` command `-set` function changes one or more network settings for an SP. Issue the command to the SP whose information you want to update.

If you omit the `-o` (override) option, the CLI displays a message in the following form to confirm the update.

Changing the name of SP `<A|B>` from oldname to newname (y/n)[n]?
Changing the IP address of SP `<A|B>` from old-address to new-address (y/n)[n]?
Changing the sub-net mask of SP `<A|B>` from old-mask to new-mask (y/n)[n]?
Changing the gateway address of SP `<A|B>` from old-gateway-address to new-gateway-address (y/n)[n]?

To make the change, enter `y`; otherwise, enter `n`.

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

For `navicli`, you must have a user entry in the Navisphere agent configuration file.

**Format**
`networkadmin -set` is used with `naviseccli` (described on page 2-6) or `navicli` (described on page 2-20) 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**

```bash
naviseccli -h payroll_storage_SPA networkadmin -set
-gatewayaddress 123.456.789.012
```

Changing the gateway address of SP A from 123.456.789.011 to 123.456.789.012 (y/n)[n] y

SP A reboots

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

---

To use this command with navicli, replace naviseccli with navicli.

**Output**

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

`NETADMIN_NOT_FOUND`
`NETADMIN_INVALID_NAME`
r3wrbuff (FC5400/5500 only)

Enables or disables RAID 3 write buffering

**Description**
The `navicli 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 4-4).

**Format**
`r3wrbuff` is used with `navicli` (described on page 2-20) 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 clt0d0s2 -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
You must be able to log in to the host running Navisphere CLI.

Format
readcru is used with navicli (described on page 2-20) as follows:

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

where

- **-crunname diskID**
  Specifies the disk ID. Use the form b_e_d, as explained in the section LUN IDs, Unique IDs, and Disk IDs, page 2-12.

- **-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 -crunname 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.
Basic Commands

**Output**

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

- `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 2-20) 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 FLARE 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
For naviseccli, you must have a user account on the storage system on which you want to execute the command.

For navicli, you must have a user entry in the Navisphere agent configuration file. For any 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 4-4).

Format
rebootSP is used with naviseccli (described on page 2-6) or navicli (described on page 2-20) as follows:

rebootSP [-both] [-o]

The optional switches are

-both
Reboot both SPs.

-o
Executes the command without prompting for confirmation.

Conventions and Recommendations
See the rebootpeerSP command, to reboot the peer SP of the target SP.

Examples
naviseccli -h ss1_spa rebootSP -both -o

To use this command with navicli, replace naviseccli with navicli.

Output
None
rebootpeerSP (AX150-Series only)

Reboots a peer SP

Description
Lets you reboot the peer SP of the target SP in a dual-SP storage system. For the rebootpeerSP command, the peer SP is the SP on the storage system to which the command is not targeted.

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

Format
rebootpeerSP is used with naviseccli (described on page 2-6) as follows:

rebootpeerSP [-o]

The optional switches are

-0

Executes the command without prompting for confirmation.

Conventions and Recommendations
See the rebootSP command, to reboot the target SP or both SPs on the storage system.

Examples
The following example reboots the peer SP of the target SP. The target SP is ss1_spa; the peer SP is ss1_spb.

naviseccli -h ss1_spa rebootpeerSP -o

Output
None
remoteconfig -getconfig

Displays information about a host or SP Agent

The remoteconfig command displays and sets Agent configuration information. An Agent can be any host Agent or SP Agent. These commands let you get and set the configuration of the Agent running on a remote host, scan all the devices in the storage system on a remote host, and stop the Agent running on a host.

If you are running a VMware ESX Server and you are issuing this command from a virtual machine (VM), please note this command requires the Navisphere Host Agent which is not supported on a VM. The Navisphere Host Agent is only supported on the ESX Server console.

Description

The naviseccli or navicli remoteconfig command with -getconfig displays information on the Agent running on an SP. For a pre-FC4700 storage system, the navicli remoteconfig command with -getconfig displays information on the Agent for the specified host. 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 when you use naviseccli is as follows. Entries marked with an asterisk (*) would appear only if you use navicli and issue the command to a host.

Description: Description of host.
Contact Person: Name and phone number of person managing the Agent.
*Device Connections: Displays following device info through Comments.
*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.
Basic Commands

*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

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

For navicli, you must be able to log in to the host running Navisphere CLI.

Format

remoteconfig -getconfig is used with naviseccli (described on page 2-6) or navicli (described on page 2-20) as follows:


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 to FC4700-Series and later storage systems).

-logsize
   Displays contents of log-entries-transfer field (does not apply to FC4700-Series and later storage systems).
-useexplicitdevicenames
Displays Enabled or Disabled (does not apply to FC4700-Series and later storage systems).

-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
naviseccli -h ss1_spa remoteconfig -getconfig
This command lists all Agent information. Sample output is below.

To use this command with navicli, replace naviseccli with navicli.

### Output
See page 3-179. If the version of FLARE software running on the SP does not support this command, a Not supported error message is printed to stderr. Other errors:

RAC_AGENT_NOT_RUNNING
**remoteconfig -reloadconfig (Not supported on AX-Series)**

Instructs the Agent to reread the agent configuration file

**Description**
The `navicli remoteconfig` command with the `-reloadconfig` function 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.

**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 4-4).

**Format**
`remoteconfig -reloadconfig` is used with `navicli` (described on page 2-20) as follows:

```
remoteconfig -reloadconfig
```

**Conventions and Recommendations**
None.

**Example**
```
navicli -h server1 remoteconfig -reloadconfig
```

This command instructs the Agent to reread the agent configuration file.

**Output**
None.
remoteconfig -scan (pre-FC4700 only)

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 3-179, which lists devices in the configuration file.)

The `-scan` function only applies to pre-FC4700 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 4-4).

**Format**

`remoteconfig -scan` is used with `navicli` (described on page 2-20) 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 -h server1 remoteconfig -scan`

This command displays device information. For sample output, see above.
**Output**  See above. If the version of FLARE software running on the SP does not support this command, a **Not supported** error message is printed to **stderr**. Other errors:

RAC_AGENT_NOT_RUNNING
### remoteconfig -setconfig

**Changes configuration information for a host or SP Agent**

**Description**

The *naviseccli* or *navicli remoteconfig* command with *-setconfig* changes the configuration information for the Agent running on an SP. For a pre-FC4700 storage system, the *navicli remoteconfig* command with *-setconfig* changes the configuration information for the Agent running on the specified host.

The comments in the Host Agent configuration file are removed. When your changes to the configuration file take effect, comments that previously resided in the file are permanently lost.

The CLI prompts for confirmation of every change you specify unless you use the *-o* (override) or *-f* switch. To change the setting for the Agent, enter *y*. The confirmation queries for all settings are as follows. Entries marked with an asterisk (*) would appear only if you use *navicli* and issue the command to a host.

- 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**

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

For *navicli*, you must have a user entry in the Navisphere agent configuration file.

**Format**

*remoteconfig -setconfig* is used with *naviseccli* (described on page 2-6) or *navicli* (described on page 2-20) as follows:
remoteconfig -setconfig [-o] [-adduser userlist] [-baudrate rate]
[-contact contactinfo] [-description description] [-f filename]
[-interval interval] [-logsize size] [-manageauto]
[-managedev devicelist] [-managelan devicelist] [-managety devicelist]
[-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 FC4700-Series and later storage systems.

-contact contactinfo
  Specifies new contact information for the Agent description field.

-description description
  Specifies new contents for the Agent description field.

-f filename (Not supported on AX-Series)
  Reads the configuration information from file filename. This file must be in the correct format (same as the Agent configuration file used in earlier Navisphere revisions). The -getconfig -write command automatically creates files in the correct format. When you use -f, the CLI does not prompt for confirmation; the -o switch is not needed.

-interval interval
  Changes the polling interval in seconds to interval. The valid range is 1 to 120. This switch may not apply to all storage-system types.

-logsize size
  Changes the maximum size of the SP log to size. This switch does not apply to FC4700-Series and later storage systems.
Basic Commands

-**manageauto**

Execute auto configuration; that is, manages all SCSI devices. This switch does not apply to FC4700-Series and later storage systems.

-**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 FC4700-Series and later storage systems.

-**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 FC4700-Series and later storage systems.

-**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 FC4700-Series and later storage systems.

-**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 FC4700-Series and later storage systems.

-**useexplicitdevicenames 0|1**

Disables (0) or enables (1) the use of explicit device names. This option does not apply to FC4700-Series and later storage systems.
**Basic Commands**

**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**

```bash
navisecccli -h ss1_spa remoteconfig -setconfig -adduser tsjones@viking
```

Add `tsjones@viking` in the authorized user list `y/n`?[y]?

This command adds the user `tsjones` on host `viking` to the Agent privileged users list.

**Output**

See page 3-185. If the version of FLARE software running on the SP does not support this command, a **Not supported** error message is printed to `stderr`. Other errors:

- RAC_AGENT_NOT_RUNNING
- RAC_REMOTECONFIG_NOT_SUPPORTED
- INVALID_MEGAPOLL
- INVALID_USEEXPLICITDEVNAME
- RAC_FILE_NOT_FOUND
removerg (RAID Group)

Removes a RAID Group

Description
The naviseccli or navicli removerg command removes a specified RAID Group.

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

For navicli, 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 4-4).

Format
removerg is used with naviseccli (described on page 2-6) or navicli (described on page 2-20) as follows:

removerg rgID

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.

Conventions and Recommendations
None

Example
naviseccli -h ss1_spa removerg 1
This command removes RAID Group 1.

To use this command with navicli, replace naviseccli with navicli.

Output
None
**responsetest**

Tests Event Monitor response

**Description**

The `naviseccli` or `navicli responsetest` command creates an artificial event to test Navisphere Event Monitor response.

The `responsetest` command is designed for use without the Event Monitor User Interface (UI). That is, you can use `responsetest` in conjunction with the Event Monitor template file, `navimon.cfg`, which you can edit to specify the Event Monitor responses you want. If you have used the Event Monitor UI to set up an Event Monitor template, do not use this command.

Event Monitor functions accessed via `responsetest` are decentralized, providing email and pager support from local storage systems only. The EMC phone home feature is not available via this command.

**User Access**

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

For `navicli`, 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` on page 4-4).

**Format**

`responsetest` is used with `naviseccli` (described on page 2-6) or `navicli` (described on page 2-20) 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.
**Basic Commands**

- **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`.  

**respondetest**
**-modempage**
(Not supported on AX-Series)

**-destnumber**  *phone-number*  Specifies the pager phone number (with area code) and is required.

**-msgnumber**  *phone-number*  Specifies the number that will appear on the pager display (with area code).

[ **-comport**  *number* ]  
Specifies the *number* is the PC COM port number. If omitted, the CLI assumes COM 1; optional.

[ **-messedelay**  *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 management host; optional.

**-desthost**  *destination-hostname*  Specifies an *snmp* management hostname; required.

**-device**  *device*  
Specifies the device represented by the snmp management host. Required.
Example

Example: `naviseccli -h ss1_spa responsetest modempage -destnumber 15055678901 -msgnumber 19990124576`

This command sends a modem page test event.

To use this command with `navicli`, replace `naviseccli` with `navicli`.

Output

Output: Result of the test.
setcache (Not supported on AX-Series)

Sets SP cache or RAID 3 size information

Description
The naviseccli or navicli 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
For naviseccli, you must have a user account on the storage system on which you want to execute the command.

For navicli, 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 4-4).

Format
setcache is used with naviseccli (described on page 2-6) or navicli (described on page 2-20) as follows:

```
setcache [-h high-watermark] [-hacv n] [-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] [-wsz write-cache-size]
```

The optional switches are

- \textit{h high-watermark}

Sets the write cache high watermark. \textit{high-watermark} specifies the percentage of dirty pages, which, when reached, causes both SPs to begin flushing the cache. The default is 80 percent for CX-Series; 60 percent for FC4700-Series. A lower value causes the SPs to start flushing the cache sooner. The high watermark cannot be less than the low watermark. To turn watermark processing off, set both the low and high watermark values to 100.
-hacv \( n \)

Enables or disables the HA cache vault. \( n \) is as follows:

1 = Enables HA cache vault (the default)
0 = Disables HA cache vault

If you set -hacv to a value other than 0 or 1, an error message appears. If you enable the HA cache vault, a single drive failure will cause the write cache to become disabled, thus reducing the risk of losing data in the event of a second drive failing. If you disable the HA cache vault, a single drive failure does not disable the write cache, leaving data at risk if a second drive fails. When you disable the HA cache vault, you will receive a warning message stating that this operation will allow write caching to continue even if one of the cache vault drives fails. If there is already a failure on one of the cache vault drives, this operation will not re-enable the write cache.

-l low-watermark

Sets the write cache low watermark. low-watermark specifies the percentage of cache dirty pages that determines when cache flushing stops. When the low watermark is reached during a flush operation, both SPs stop flushing the cache. The default is 60 percent for CX-Series; 40 percent for FC4700-Series. The low watermark cannot be greater than the high watermark. To turn watermark processing off, set both the low and high watermark values to 100.

-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. Valid only for non-Fibre Channel storage systems.

-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). \textit{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 \textit{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 4 Mbytes (for CX-Series or FC4700-Series storage systems).

-rszb read-cache-size-spb

Sets the read cache size for SP B to \textit{read-cache-size-spb} Mbytes.

-rca read-cache-spa

Enables or disables the read cache function for SP A. For \textit{read-cache-spa}:

\begin{itemize}
  \item \texttt{0} = Disables read cache
  \item \texttt{1} = Enables read cache
\end{itemize}

-rcb read-cache-spb

Enables or disables the read cache function for SP B. For \textit{read-cache-spb}:

\begin{itemize}
  \item \texttt{0} = Disables read cache
  \item \texttt{1} = Enables read cache
\end{itemize}
**Basic Commands**

- **wc**: write-cache

  Enables or disables the write cache function. For write-cache:
  - 0 = Disables write cache
  - 1 = Enables write cache

- **wsz**: write-cache-size-sp

  Sets the write cache size for the storage system to `write-cache-size-sp` Mbytes. Also, see the note on sizes under `-rsza`.

**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**

```plaintext
naviseccli -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.

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

This command sets the write cache (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.

To use this command with `navicli`, replace `naviseccli` with `navicli`.

**Output**

None
**setfeature (FC4700-Series and later)**

Adds a software feature to a LUN controlled by an SP

**Description**

In Navisphere, the `naviseccli` or `navicli setfeature` command adds and removes a software driver feature to a LUN owned by an SP.

**User Access**

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

For `navicli`, you must have a user entry in the Navisphere agent configuration file.

**Format**

`setfeature` is used with `naviseccli` (described on page 2-6) or `navicli` (described on page 2-20) 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 and sancopy for SAN Copy.

- `-lun lun` or `-lunuid uid`
  
  Specifies the LUN. You can use the LUN number or the LUN unique ID, UID (which is the World Wide Name, WWN).

**Output**

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

- `COMMAND_NOT_SUPPORTED`
- `FEATURE_REQUIRED`
- `LUN_AND_LUNUID_SPECIFIED`
**setloop (Not supported on CX-Series or AX-Series)**

Sets fibre loop information

This command applies only to Fibre Channel storage systems.

**Description**
The `navicli setloop` command sets information about the fiber loop.
This command is not supported on CX-Series systems.
This command is not valid in CLI versions 4.X or higher for IRIX hosts.

**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 4-4).

**Format**
`setloop` is used with `navicli` (described on page 2-20) 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 -h ss1_spa setloop -spfo 1 -ple 0
navicli -h ss1_spa 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 navicli 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 2-20) as follows:

setraid5 [-on | -off] [-o]

where

- **-on**
  Enables mixed mode RAID 5.

- **-off**
  Disables mixed mode RAID 5.

- **-o**
  Executes the command without prompting for confirmation.

Conventions and Recommendations
None

Example

```
navicli -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 (Not supported on AX-Series)

Starts a background verify process or changes verify process parameters

Description
The naviseccli or navicli setsniffer command starts a background verify process or changes the parameters for the verify process. You can indicate a specific LUN, all LUNs in a Raid Group, or all LUNs in a storage system.

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

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

For navicli, 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 4-4).

Format
setsniffer is used with naviseccli (described on page 2-6) or navicli (described on page 2-20) as follows:

setsniffer
-all | lun | -rg raidgroupnumber [-bv] [-bvtime priority] [-cr]

where

-all
Indicates to apply sniffer parameters to all luns in the storage system. The target SP must own one LUN at minimum.

lun
Indicates to apply sniffer parameters to the specified LUN. lun specifies the logical unit number. You must target the SP that owns the specified LUN.

-rg raidgroupnumber
Indicates to apply sniffer parameters to all luns in the specified Raid Group.

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.

Conventions and Recommendations

None

Example

naviseccli -h 128.111.222.33 setsniffer 0 -bv -bvtime high

Starts a background verify on LUN 0 and sets the verify priority to high.

To use this command with navicli, replace naviseccli with navicli.

Output

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

Sets SPS or BBU battery test time

**Description**

The `navisecl` or `navicli setspstime` command sets the SPS battery test time. If no switches are specified, the command returns the current SPS battery test time. The SPS test time is displayed for the client's time zone.

**User Access**

For `navisecl`, you must have a user account on the storage system on which you want to execute the command.

For `navicli`, 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 4-4).

**Format**

`setspstime` is used with `navisecl` (described on page 2-6) or `navicli` (described on page 2-20) as follows:

```
setspstime [-d day-num] [-h hour-num] [-m minute-num] [-nolocal]
```

The optional switches are

- `-d day-num`
  
  Sets the day of the week (0-6, 0=Sunday).

- `-h hour-num`
  
  Sets the hour of the day (0-23, 0=12:00 AM).

- `-m minute-num`
  
  Sets the minute of the hour (0-59).

To set the SPS or BBU test time, all switches must be specified.

- `-nolocal`
  
  For FC4700 and later storage systems, the SPS test time is displayed for the client's time zone. This is different from the time on a pre-FC4700 storage system, where the SPS test time is displayed for the storage system's time zone. For a pre-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.

-`nolocal` is required if your system is communicating with a host Agent version less than 6.5. You cannot use this switch with version 6.5 or higher.

**Example**

```
naviseccli -h ss1_spa setspstime -d 0 -h 1 -m 0
```

This example sets the SPS battery test time to Sunday at 1:00 AM.

To use this command with `navicli`, replace `naviseccli` with `navicli`.

**Output**

There is no output. Errors are printed to `stderr`. 
setsptime (FC4700-Series and later)

Sets the SP system clocks

Description
The naviseccli or navicli setsptime command sets the system time for both SPs.

User Access
For naviseccli, you must have a user account on the storage system on which you want to execute the command.
For navicli, you must have a user entry in the Navisphere agent configuration file.

Format
setsptime is used with naviseccli (described on page 2-6) or navicli (described on page 2-20) as follows:

```
```

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).

Example
naviseccli -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.

To use this command with navicli, replace naviseccli with navicli.

Output
There is no output. Errors are printed to stderr.
setstats (Not supported on AX-Series)

Sets statistics logging

Description

The naviseccli or navicli 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

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

For navicli, 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 4-4).

Format

setstats is used with naviseccli (described on page 2-6) or navicli (described on page 2-20) 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

Example

```
naviseccli -h ss1_spa setstats -on
```

To use this command with navicli, replace naviseccli with navicli.

Output

There is no output. Errors are printed to stderr.
Basic Commands

**shutdown (AX-Series only)**

Shuts down and powers off the storage system

**Description**
The `naviseccli` or `navicli shutdown` command shuts down and powers off the storage system you specify.

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

For `navicli`, you must have a user entry in the Navisphere agent configuration file.

**Format**
`shutdown` is used with `naviseccli` (described on page 2-6) or `navicli` (described on page 2-20) as follows.

```
shutdown [-o]
```

where

- `-o`

  Executes the command without prompting for confirmation.

**Conventions and Recommendations**
None.

**Example**
`naviseccli -h ss1_spa shutdown`

This command shuts down and powers off the specified storage system.

To use this command with `navicli`, replace `naviseccli` with `navicli`.

Before you shutdown the storage system, stop all I/O from any servers connected to the storage system and save all unsaved data to disk. During the shutdown process you will lose access to all data on the LUNs but you will not lose any data. When you power up the storage system you will regain access to the LUNs.

Do you want to shutdown and power off the subsystem now (y/n)?

**Output**
None if the command succeeds; status or error information if it fails.
**spcollect -info (Automated version)**

Displays the setting of the automated SPCollect service

**Description**

The `naviseccli` or `navicli.jar spcollect` command with the `-info` function lets you display the setting of the automated SPCollect functionality. The setting appears as `Enabled` when the SPCollect automated functionality is turned on; `Disabled` when it is turned off.

The automated SPCollect service is part of the `Peerwatch` service included with FLARE Operating Environment version 02.19.xxx.5.yyy or higher.

**User Access**

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

**Format**

`spcollect -info` is used with `naviseccli` (described on page 2-6) or `navicli.jar` (described on page 2-31) as follows:

```
spcollect -info
```

**Example**

`naviseccli -address ss1_spa spcollect -info`

This command shows you the setting of the automated SPCollect functionality for the specified storage system. The `Enabled` setting, indicating that the SPCollect process is turned on, appears in the output below.

```
AutoExecution: Enabled
```

To use this command with `navicli.jar`, replace `naviseccli` with `java -jar navicli.jar`.

**Output**

`AutoExecution: Enabled`
**spcollect -set (Automated version)**

Sets the automated SPCollect service on or off

**Description**
The `naviseccli` or `navicli.jar spcollect` command with the `-set` function lets you set the automated SPCollect process on or off.

The automated SPCollect service is part of the `Peerwatch` service included with FLARE Operating Environment version 02.19.xxx.5.yyy or higher.

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

**Format**
`spcollect -set` is used with `naviseccli` (described on page 2-6) or `navicli.jar` (described on page 2-31) as follows:

```
spcollect -set -auto on | off [-o]
```

where

- `-auto on | off`

  Specifies to set the automated SPCollect process on or off. If you indicate `on`, it turns the automation service on; `off` indicates to turn the automation service off.

- `-o`

  Executes the command without prompting for confirmation.

**Conventions and Recommendations**
Use `spcollect -info` to verify whether the service is enabled or disabled.

**Example**
`naviseccli -address ss1_spa spcollect -set -auto on`

This command turns the automated SPCollect process on.

To use this command with `navicli.jar`, replace `naviseccli` with `java -jar navicli.jar`.

**Output**
None if the command succeeds; status or error information if it fails.
spcollect (Manual version)

Selects and places a collection of storage system log files into a single .zip file

**Description**

The naviseccli or navicli spcollect command selects a collection of storage system log files and places them in a single .zip file on the storage system. You can retrieve the file from the storage system using the managefiles command.

This command is not related to the automated SPCollect service that is part of the Peerwatch service included with FLARE Operating Environment version 02.19.xxx.5.yyy or higher. This command lets you run the SPCollect functionality separate from the scheduled service. See the spcollect -set command to enable or disable the automated SPCollect service.

**Important** The SPCollect functionality can affect system performance (may degrade storage system performance).

**User Access**

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

For navicli, you must have a user entry in the Navisphere agent configuration file.

**Format**

spcollect is used with naviseccli (described on page 2-6) or navicli (described on page 2-20) as follows:

spcollect

**Conventions and Recommendations**

None.

**Example**

naviseccli -h ss1_spa spcollect

This example creates a .zip file on the storage system, which contains system log files.

The .zip file has the following format:

SPx_arrayserialnumber_spsignature_date_time_data.zip
where

\[ x \] SP A or B.
\[ arrayserialnumber \] Storage system serial number.
\[ spsignature \] SP signature
\[ date \] Date of collection.
\[ time \] Time of collection.

To use this command with `navicli`, replace `naviseccli` with `navicli`.

**Output**

There is no output. Errors are printed to `stderr`. 
spportspeed (FC4700-Series and later)

Set or get the SP port speed

**Description**
The `naviseccli` or `navicli spportspeed` command gets or sets the SP port speed. You can set the port speed on either SP directly or through the other SP. The port speed you can set and the options available depend upon your storage-system type.

For a port speed to work, the HBA, switch, and SP must all support it. You can set the ports of an SP to different speeds if the ports connect to switches or HBAs with different speeds.

**CAUTION**
Incompatible port speeds will prevent the two devices from communicating. The CLI prompts for confirmation as follows before executing the `-set` command.

Changing the port speed is a disruptive function. Verify that the other device connected to the 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 to n Gigabit <y/n>?

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

For `navicli`, you must have a user entry in the Navisphere agent configuration file.
Format  

`sportspeed` is used with `naviseccli` (described on page 2-6) or `navicli` (described on page 2-20) as follows:

`sportspeed -get [-isauto] [-avail]`

where

-`-isauto`  
Indicates whether the Auto-Negotiate feature is turned on or off. The CLI returns a yes value if the feature is turned on, a no value if the feature is turned off, and a not supported value if the feature is not supported.

If you have the Auto-Negotiate feature turned on, the Speed Value that is generated in the output does not have a value of auto. The value reflects the speed at which the port is currently set.

-`-avail`  
Indicates the available speeds for a specified port.

or

`sportspeed -set -sp sp -portid port speed`

where

-`-sp sp`  
Specifies the SP to set the port speed on `a | b`.

-`-portid port speed`  
`port` specifies the port on the SP (0, 1, 2, or 3).

`speed` specifies the port speed: See the note above. For Fibre Channel systems, port speed is 1 for 1-Gbit mode and 2 for 2-Gbit mode. For iSCSI systems, port speed is 10 for 10-Mbit mode, 100 for 100-Mbit mode, 1000 for 1000-Mbit mode, `auto` to initiate the Auto-Negotiate feature.

Conventions and Recommendations  

None
Example  

```
naviseccli  -h  ss1_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  
```

```
naviseccli  -h  ss1_spa  spportspeed  -set  -sp  a  -portid  0  2
```

Changing the port speed is a disruptive function. Verify that the other device connected to the 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 example displays the port speeds of the SP `ss1_spa` and its peer SP. The `set` command example sets the SP port speed of SP A port 0 to 2 Gbits/second.

To use this command with navicli, replace naviseccli with navicli.

Output  

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

spportspeed (FC4700-Series and later)  3-215
**systemtype (Not supported on AX-Series)**

Sets the storage-system type

**Description**

The `naviseccli` or `navicli 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.

---

Do not change the system type of any storage sytem running Access Logix.
Do not change the system type of a storage system unless it has been quiesced. The Agent must be running and managing the storage system.

---

**User Access**

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

For `navicli`, 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 4-4).

**Format**

`systemtype` is used with `naviseccli` (described on page 2-6) or `navicli` (described on page 2-20) 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 - HP type

-o

Executes the command without prompting for confirmation.

Conventions and Recommendations
Depending on the type of HP-UX operating system, you may want auto-trespass to be on or off.

Examples

```
naviseccli -h ss1_spa systemtype
The configured system type is: 0x3
The current system type is: 0x3

naviseccli -h ss1_spa systemtype -config 2
In order for this command to execute, write cache must be disabled and memory size set to zero:

naviseccli -h ss1_spa 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.

To use this command with navicli, replace naviseccli with navicli.
```

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.

Not applicable to single-SP storage systems.

For FC4700-Series and later storage systems, 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**

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

For `navicli`, you must have a user entry in the Navisphere agent configuration file.

**Format**

`trespass` is used with `naviseccli` (described on page 2-6) or `navicli` (described on page 2-20) 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.
## Basic Commands

### Conventions and Recommendations

None

### Example

```bash
naviseccli -h ss1_spa trespass all
```

To use this command with `navicli`, replace `naviseccli` with `navicli`.

### Output

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

Deconfigures a LUN

Description
The naviseccli or navicli 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(s). If you do not want the prompt to appear, you can override prompting using the -o switch.

For FC4700-Series and later storage systems, 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.

You can unbind multiple LUNs at the same time.

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

For navicli, 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 4-4).

Format **unbind** is used with naviseccli (described on page 2-6) or navicli (described on page 2-20) 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

```
naviseccli -h ss1_spa unbind 3 -o
```

This command destroys (deconfigures) LUN 3 without prompting you for permission, and frees its disks to be reconfigured.

```
naviseccli -h ss1_spa unbind 0 1 2 3 4 -o
```
Basic Commands

This command destroys (deconfigures) LUNs 0, 1, 2, 3, and 4 without prompting you for permission, and frees its disks to be reconfigured.

To use this command with navicli, replace naviseccli with navicli.

Output

None
unitserialnumber

Displays or changes the VDPP80 (port 80) behavior mode

Description
The naviseccli or navicli 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 4.

For FC4700-Series and later storage systems, each SP is a host (-h switch) to which you address the command.

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

For navicli, you must have a user entry in the Navisphere agent configuration file.

Format
unitserialnumber is used with naviseccli (described on page 2-6) or navicli (described on page 2-20) as follows:

unitserialnumber [array | lun] [-o]

where
array
Sets the behavior mode to array (storage system).

lun
Sets the behavior mode to LUN.

-o
Executes the command without prompting for confirmation.

Conventions and Recommendations
None

Examples
naviseccli -h ss1_sp unitserialnumber
Current unit serial number mode is: LUN

naviseccli -h ss1_sp unitserialnumber array
These two commands display the current behavior mode and then set the mode to **array** (storage-system) mode.

To use this command with **navicli**, replace **naviseccli** with **navicli**.
upload (pre-FC4700 only)

Copies FLARE software dump data to a file

**Description**

Transfers to a disk file the dump data written by the FLARE 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**

You must be able to log in to the host running Navisphere CLI. Write access to the destination directory is required.

**Format**

`upload` is used with `navicli` (described on page 2-20) 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.

- `-disk disk` specifies the disk from which the CLI will copy the data. It cannot be used with `-select la` or `lb` options. `-disk` is a switch for the `-pathname` switch.
Basic Commands

-**select**  a | b | ab | la | lb | lab

Specifies which diagnostic data to copy to the file. **-select** is a switch for the **-pathname** switch. The values have the following meanings:

a - Copies SP A's FLARE software dump
b - Copies SP B's FLARE software dump
ab - Copies SP A's and B's FLARE software dump
la - Copies SP A's latest FLARE software dump
lb - Copies SP B's latest FLARE software dump
lab - Copies SP A's and B's latest FLARE software dump

The optional switch for **upload** is

-**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.

**Conventions and recommendations**

None.

**Examples**

```
navicli -d clt0d0s2 -h server1 upload -pathname c:\temp\csdump.txt -report
```

This command copies the state of mode page 39 at the time of the last FLARE software dump into file *csdump.txt* in directory *c:\temp*.

**Output**

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

Possible errors:

- DIRECTORY_REQUIRED
- F_OPTION_REQUIRED
- INCOMPATIBLE_ARGUMENTS
- INVALID_SELECT_VALUES
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 ....................... 4-2
- accesscontrol (FC4500 and FC5300) ................................................. 4-4
- fairness (FC4500 and FC5300) .......................................................... 4-6
- port ....................................................................................................... 4-8
- register ............................................................................................... 4-21
- sc_off (Not supported on AX-Series) ............................................ 4-22
- storagegroup ..................................................................................... 4-24
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 3 for example use of the CLI.

   If you are running a VMware ESX Server, you can bind LUNs from the ESX Server or a virtual machine.

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 hosts to Storage Groups 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.

   If you are running a VMware ESX Server, assign the ESX Server to the Storage Group.

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.
If you are running a VMware ESX Server, rescan the bus at the ESX Server level, set the LUNs as a physical compatibility mode, and define the LUNs as Raw Device Mapping (RDM) volumes (required for CLARiiON replication software; you can create VMFS volumes; however, they are not valid for CLARiiON replication software). You must then power down any virtual machine to which you will assign LUNs and assign the LUNs to the virtual machines using the ESX Service Console. When complete, power up the virtual machine.

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 `navicli 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 2-20) as follows:

```
```

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` commands).

- `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

```plaintext
navicli -d c10d0s2 -h server1 accesscontrol -passwd
```

## Output

If the version of FLARE 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)
```
Access Logix (Storage Group) Commands

**fairness (FC4500 and FC5300)**

Enables or disables fairness

**Description**

The `navicli 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 4-4).

**Format**

`fairness` is used with `navicli` (described on page 2-20) as follows:

```
fairness [-on | -off]
```

where

- **-on**
  
  Enables fairness.

- **-off**
  
  Disables fairness (off is the default state).
### Conventions and Recommendations
None

### Examples
```bash
navicli -d c1t0d0s1 -h server1 fairness
```
Displays the current state.

### Output
A message indicating the new status of fairness: On or Off.
**port**

Lists SP port information, removes an HBA entry from an SP’s initiator list, and provides diagnostic capabilities

**Description**
The `naviseccli` or `navicli port` command lists SP port information, removes an HBA entry from an SP’s permitted initiator list (initiator record), and provides diagnostic capabilities for SAN Copy initiator records and duplicate host initiator records. For CX-Series or FC4700-Series storage systems, see also the `storagegroup -setpath` command starting on page 4-34 and `alpa` command, page 3-8.

To register an HBA with a storage system (opposite of removing an HBA entry), use the `register` command.

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

For `navicli`, 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 4-4).

**Format**
`port` is used with `naviseccli` (described on page 2-6) or `navicli` (described on page 2-20) as follows:

```
pport [-diagnose [optional-diagnose-switches]] [-list [optional-list-switches]] [-removeHBA [optional-removeHBA -switches] [-o]]
```

The optional `port -diagnose` switches are

- `[-sancopy [-clean]] [-host]`
  - `sancopy [-clean]`
    - Lists the SAN Copy initiator records where the initiator is the same as that of the targeted SP. If you include the optional `-clean` switch, the CLI prompts you to remove the initiator records that are displayed.
  - `host`
    - Scans the host initiator records and displays duplicate hosts with the same host ID.
The optional **port -list** switches are

```
[-hba] [-initiatorcount] [-sp] [-uid StorageGroupUID]
[-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 **arraycommpath** setting: 0 if **arraycommpath** 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, 2, or 3. 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**

Returns information on HBA ports. The initiator and target **-hba** field returns different information depending on whether you are targeting a Fibre Channel or an iSCSI HBA. When you
target a Fibre Channel HBA, the `-hba` returns the world wide
name such as:
10:00:00:00:C9:20:DE:0C:10:00:00:00:C9:20:DE:0C. When you
target an iSCSI HBA, `-hba` returns the initiator name.

-initiatorcount
Displays the initiator information for each port on a given SP.
Lists the number of initiators that are defined, logged-in and
those that are not logged in.

-mac
Displays the MAC address for the front end ports of an iSCSI
storage system. Running the `port ... -mac` command returns a
`MAC Address` field for each port. When you run the `port ...
-mac` command, if any ports are Fibre Channel ports, the `MAC
Address` field for those ports will display `Not Applicable`.

-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.

The optional `port -removeHBA` switches are

```
[-hbauid hbauid | -host hostname | -hostip IPAddress | -all]
```

-all
Removes all initiator records that are logged out and registered,
for the specified storage system.

-hbauid hbauid
Removes a specific initiator record specified with `-hbauid`. `hbauid`
specifies a unique host bus adapter identification number (must
use uppercase).

-host hostname
Removes all initiator records that are logged out and registered,
for the specified host name.
-hostip $IPAdress

Removes all initiator records that are logged out and registered, for the specified host IP address.

-o

Executes the command without prompting for confirmation.

Example 1

The following example shows sample output of the *port -list* command targeted to Fibre Channel HBAs and SPs.

```
navisecci -h ss1_spa port -list
```

To use this command with *navicli*, replace *navisecci* with *navicli*.

Information about each HBA:

HBA UID:

```
```

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:
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:

- **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:E0:50:06:01:69:50: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
Access Logix (Storage Group) Commands

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 Storage Group 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

The following example shows sample output of the port-list-all command targeted to Fibre Channel HBAs and SPs.

naviseclcli -h ss1_spa port -list-all

to use this command with navicli, replace naviseclcli with navicli.

Information about each HBA:

HBA UID:
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:
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:
Access Logix (Storage Group) Commands

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:           256
StorageGroup Name:     None
ArrayCommPath:         0
Failover mode:         0

Information about each HBA:

HBA UID:
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:

<table>
<thead>
<tr>
<th>SP Name</th>
<th>SP Port ID</th>
<th>HBA Devicename</th>
</tr>
</thead>
<tbody>
<tr>
<td>SP A</td>
<td>0</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Trusted</th>
<th>Logged In</th>
<th>Defined</th>
<th>Initiator Type</th>
<th>StorageGroup Name</th>
<th>ArrayCommPath</th>
<th>Failover mode</th>
</tr>
</thead>
<tbody>
<tr>
<td>NO</td>
<td>NO</td>
<td>YES</td>
<td>3</td>
<td>PublicStorageGroup</td>
<td>1</td>
<td>2</td>
</tr>
</tbody>
</table>

Information about each SPPORT:

<table>
<thead>
<tr>
<th>SP Name</th>
<th>SP Port ID</th>
<th>SP UID</th>
<th>Link Status</th>
<th>Port Status</th>
<th>Switch Present</th>
<th>Switch UID</th>
<th>SP Source ID</th>
</tr>
</thead>
<tbody>
<tr>
<td>SP B</td>
<td>0</td>
<td>50:06:01:60:D0:C3:0F:E0:50:06:01:68:50:C3:0F:E0</td>
<td>Up</td>
<td>Online</td>
<td>YES</td>
<td>727296</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SP Name</th>
<th>SP Port ID</th>
<th>SP UID</th>
<th>Link Status</th>
<th>Port Status</th>
<th>Switch Present</th>
<th>Switch UID</th>
<th>SP Source ID</th>
</tr>
</thead>
<tbody>
<tr>
<td>SP B</td>
<td>1</td>
<td>50:06:01:60:D0:C3:0F:E0:50:06:01:69:50:C3:0F:E0</td>
<td>Down</td>
<td>DISABLED</td>
<td>YES</td>
<td>239</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SP Name</th>
<th>SP Port ID</th>
<th>SP UID</th>
<th>Link Status</th>
<th>Port Status</th>
<th>Switch Present</th>
<th>Switch UID</th>
<th>SP Source ID</th>
</tr>
</thead>
<tbody>
<tr>
<td>SP A</td>
<td>0</td>
<td>50:06:01:60:D0:C3:0F:E0:50:06:01:60:50:C3:0F:E0</td>
<td>Up</td>
<td>Online</td>
<td>YES</td>
<td>661760</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SP Name</th>
<th>SP Port ID</th>
<th>SP UID</th>
<th>Link Status</th>
<th>Port Status</th>
<th>Switch Present</th>
<th>Switch UID</th>
<th>SP Source ID</th>
</tr>
</thead>
<tbody>
<tr>
<td>SP A</td>
<td>1</td>
<td>50:06:01:60:D0:C3:0F:E0:50:06:01:60:50:C3:0F:E0</td>
<td>Up</td>
<td>Online</td>
<td>YES</td>
<td>661760</td>
<td></td>
</tr>
</tbody>
</table>
Example 3

The following example shows sample output of the `port-list-hba` command targeted to an iSCSI HBA.

```
naviseccli -h IPAddress_SP port-list-hba
```

To use this command with navicli, replace `naviseccli` with `navicli`.

Information about each HBA:
- Server Name: nlpc20234
- Server IP Address: 25.24.23.235
- HBA Model Description:
- HBA Vendor Description:
- HBA Device Driver Name:

Information about each port of this HBA:
- SP Name: SP A
- SP Port ID: 0
- HBA Devicename: \\.\SCSI2:0:0:1
- Trusted: NO
- Logged In: YES
- Source ID: 4294967295
- Defined: YES
- Initiator Type: 3
- StorageGroup Name: StorageGrpnlpc20234

Information about each SPPORT:
- SP Name: SP A
- SP Port ID: 0
- SP UID: iqn.1992-04.com.emc:cx.apm00034901526.a0
- Link Status: Up
- Port Status: Online
- Switch Present: Not Applicable

- SP Name: SP A
- SP Port ID: 1
- SP UID: iqn.1992-04.com.emc:cx.apm00034901526.a1
- Link Status: Down
- Port Status: Online
- Switch Present: Not Applicable
<table>
<thead>
<tr>
<th>SP Name: SP B</th>
<th>SP Port ID: 0</th>
<th>SP UID: iqn.1992-04.com.emc:cx.apm00034901526.b0</th>
<th>Link Status: Down</th>
<th>Port Status: Online</th>
<th>Switch Present: Not Applicable</th>
</tr>
</thead>
<tbody>
<tr>
<td>SP Name: SP B</td>
<td>SP Port ID: 1</td>
<td>SP UID: iqn.1992-04.com.emc:cx.apm00034901526.b1</td>
<td>Link Status: Down</td>
<td>Port Status: Online</td>
<td>Switch Present: Not Applicable</td>
</tr>
</tbody>
</table>

**Example 4**

The following example shows sample output of the `port-list-mac` command targeted to an iSCSI storage system.

`naviseccli -h 10.14.80.107 port-list-sp-mac`

To use this command with `navicli`, replace `naviseccli` with `navicli`.

<table>
<thead>
<tr>
<th>Information about each SPPORT:</th>
<th>SP Name: SP B</th>
<th>SP Port ID: 0</th>
<th>SP UID: iqn.1992-04.com.emc:cx.apm00034901792.b0</th>
<th>Link Status: Down</th>
<th>Port Status: Online</th>
<th>Switch Present: Not Applicable</th>
<th>MAC Address: 00:60:16:01:83:AF</th>
</tr>
</thead>
<tbody>
<tr>
<td>SP Name: SP B</td>
<td>SP Port ID: 1</td>
<td>SP UID: iqn.1992-04.com.emc:cx.apm00034901792.b1</td>
<td>Link Status: Up</td>
<td>Port Status: Online</td>
<td>Switch Present: Not Applicable</td>
<td>MAC Address: 00:60:16:01:83:B1</td>
<td></td>
</tr>
<tr>
<td>SP Name: SP A</td>
<td>SP Port ID: 0</td>
<td>SP UID: iqn.1992-04.com.emc:cx.apm00034901792.a0</td>
<td>Link Status: Down</td>
<td>Port Status: Online</td>
<td>Switch Present: Not Applicable</td>
<td>MAC Address: 00:60:16:01:82:89</td>
<td></td>
</tr>
<tr>
<td>SP Name: SP A</td>
<td>SP Port ID: 1</td>
<td>SP UID: iqn.1992-04.com.emc:cx.apm00034901792.a1</td>
<td>Link Status:</td>
<td>Port Status: Online</td>
<td>Switch Present: Not Applicable</td>
<td>MAC Address:</td>
<td></td>
</tr>
</tbody>
</table>
Example 5

The following example shows sample output of the `port-list-mac` command targeted to a *Fibre Channel* storage system.

```
naviseccli -h 10.14.5.202 port-list-sp-mac
```

To use this command with *navicli*, replace `naviseccli` with `navicli`.

Information about each SP/PORT:

**SP Name:** SP A
**SP Port ID:** 1
**SP UID:** 50:06:01:60:90:21:26:3D:50:06:01:61:10:21:26:3D
**Link Status:** Up
**Port Status:** Online
**Switch Present:** NO
**MAC Address:** Not Applicable

**SP Name:** SP A
**SP Port ID:** 0
**SP UID:** 50:06:01:60:90:21:26:3D:50:06:01:60:10:21:26:3D
**Link Status:** Up
**Port Status:** Online
**Switch Present:** YES
**Switch UID:** 10:00:08:00:88:60:8E:77:20:0D:08:00:88:60:8E:77
**SP Source ID:** 7998739
**MAC Address:** Not Applicable

**SP Name:** SP B
**SP Port ID:** 1
**SP UID:** 50:06:01:60:90:21:26:3D:50:06:01:69:10:21:26:3D
**Link Status:** Up
**Port Status:** Online
**Switch Present:** NO
**MAC Address:** Not Applicable

**SP Name:** SP B
**SP Port ID:** 0
**SP UID:** 50:06:01:60:90:21:26:3D:50:06:01:68:10:21:26:3D
**Link Status:** Up
**Port Status:** Online
**Switch Present:** YES
**Switch UID:** 10:00:08:00:88:60:8E:77:20:0C:08:00:88:60:8E:77
**SP Source ID:** 7998483
**MAC Address:** Not Applicable
register

Enables HBA(s) to be associated with a specified hostname

To use the navicli register command, you must be a privileged user in the Host Agent configuration file.

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.

To remove an HBA registration from a storage system (unregister the HBA), use the port command with the -removeHBA switch.

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 2-20) 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 (Not supported on AX-Series)**

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 naviseccli or navicli 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**

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

For navicli, you must have a user entry in the Navisphere agent configuration file. For a pre-FC4700-Series storage system, if configuration access control is enabled, you must issue the command from a trusted server (see accesscontrol (FC4500 and FC5300) on page 4-4).

**Format**

sc_off is used with naviseccli (described on page 2-6) or navicli (described on page 2-20) as follows:

```
sc_off [-o]
```

- `-o` Executes the command without prompting for confirmation.

**Conventions and Recommendations**

None

**Example**

```
naviseccli -h ss1_spa sc_off
```

To use this command with navicli, replace naviseccli with navicli.

**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 navisecli or navicli 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

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

For navicli, you must have a user entry in the Navisphere agent configuration file. For a pre-FC4700-Series storage system, if configuration access control is enabled, you must issue the command from a trusted server (see accesscontrol (FC4500 and FC5300) on page 4-4).

Format

storagegroup is used with navisecli (described on page 2-6) or navicli (described on page 2-20) as follows:

storagegroup
[-addhlu switches] |  
[-addsnapshot switches] |  
[-chgname switches] |  
[-connecthost switches] |  
[-create switch] |  
[-destroy switch] |  
[-disconnecthost switch] |  
[-enable] |  
[-list switches] |  
[-removehlu switches] |  
[-removesnapshot switches] |  
[-sethost switches] |
[-setpath switches]  |
[-shareable  switch]  |

The switches are as follows.

storagegroup  command, -addhlu switch
-addhlu  -gname StorageGroupName | -uid StorageGroupUID
-hlu hlunumber   -alu alunumber

Adds a host LUN to a Storage Group. This command requires a bound LUN. If required, use the bind command to create a LUN. You must use -gname or -uid and two other switches with -addhlu as follows. Also see the example on page 4-38.

-gname StorageGroupName
Specifies the name of the Storage Group.

-uid StorageGroupUID
Specifies the Storage Group unique identification number.

For Fibre Channel storage systems, the UID uses the world wide name (WWN) format such as:
10:00:00:00:C9:20:DE:0C:10:00:00:00:C9:20:DE:0C.

For iSCSI storage systems, the UID uses the initiator name which uses the IQN format such as:

-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.

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. This switch is required along with -hlu and either the -gname or -uid switch.

storagegroup command, -addsnapshot switch

-addsnapshot  -gname StorageGroupName | -uid StorageGroupUID
-hlu hlunumber -snapshotname snapshotname | -snapshotuid snapshotuid

-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.

For Fibre Channel storage systems, the UID uses the world wide name (WWN) format such as:
10:00:00:00:C9:20:DE:0C:10:00:00:00:C9:20:DE:0C.

For iSCSI storage systems, the UID uses the initiator name which uses the IQN format such as:

-hlu hlunumber

Specifies the host LUN number for the snapshot, which is the unique number that the storage-system server will see. hlunumber is the virtual LUN number.

-snapshotname snapshotname | -snapshotuid snapshotuid

Specifies the snapshot name or unique ID number (World Wide Name, WWN). One of these switches is required along with the -gname or -uid switch.
storagegroup command, -chgname switch
-chgname -gname StorageGroupName | -uid StorageGroupUID 
-newgname NewName [-o]

Renames the Storage Group. You must use two of the following switches with -chgname:

-gname StorageGroupName

Specifies the name of the Storage Group. StorageGroupName specifies a user-defined Storage Group name.

-uid StorageGroupUID

Specifies the Storage Group unique identification number.
For Fibre Channel storage systems, the UID uses the world wide name (WWN) format such as:
10:00:00:00:C9:20:DE:0C:10:00:00:00:C9:20:DE:0C.
For iSCSI storage systems, the UID uses the initiator name which uses the IQN format such as:

-newgname NewName

Sets the new Storage Group name for the Storage Group (specified by the -gname or -uid switch). NewName specifies the new name for the specified Storage Group.

-o

Executes the command without prompting for confirmation.

storagegroup command, -connecthost switch
-connecthost -host HostName 
-gname StorageGroupName | -uid StorageGroupUID [-o]

Connects the specified host to the specified storage group. It connects all of the host’s HBA/SP combinations to the Storage Group by assigning the host’s initiator records to the Storage Group. To assign a Storage Group to a specific HBA, use storagegroup -setpath.
You may use the 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 4-38.

- **-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 4-38.

- **-gname StorageGroupName**
  `StorageGroupName` specifies a user-defined Storage Group name.

**storagegroup** command, `-destroy` switch

- **-destroy -gname StorageGroupName | -uid StorageGroupUID [-o]**
  Destroys the specified Storage Group. If you include the `-o` switch, the command will be executed without asking for user confirmation. You must use one of the following switches with `-destroy`:

- **-gname StorageGroupName**
  `StorageGroupName` specifies a user-defined Storage Group name.

- **-uid StorageGroupUID**
  Specifies the Storage Group unique identification number.
storagegroup command, -disconnecthost switch

**-disconnecthost -host HostName [-o]**

Disconnects all of the specified host’s HBA/SP combinations from the currently connected Storage Group, and reconnects them to `~management`. You must specify the host using the `-host` switch. If the `-o` switch is present, the command will be executed without asking for user confirmation.

- **-host HostName**
  
  `HostName` specifies the user-defined host name.

storagegroup command, -enable switch [-o]

Enables data access control. Sets the default Storage Group to `~management`. If the `-o` switch is present, the command will be executed without asking for user confirmation.

storagegroup command, -list switch

**-list [-gname StorageGroupName | -uid StorageGroupUID ] -host**

Displays information about the specified Storage Group. When no Storage Group is specified, `-list` displays information about each user-defined Storage Group in the system. You can use one of the following optional switches with `-list`.

- **-gname StorageGroupName**
  
  `StorageGroupName` specifies a user-defined Storage Group name.

- **-host**
  
  Displays the hostname of the attached host.

- **-uid StorageGroupUID**
  
  Specifies the Storage Group unique ID.

storagegroup command, -removehlu switch

**-removehlu -gname StorageGroupName | -uid StorageGroupUID -hlu hlnumber**

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.

Access Logix (Storage Group) Commands

- **-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*

**-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.

**storagegroup** command, **-sethost** switch

**storagegroup** command

**-sethost** [-**host** *hostname* | -**ip** *host-ip-address*]

[-**arraycommpath** 0 | 1] [-**failovermode** 0 | 1 | 2 | 3]

[-**type** *initiator-type*] [-**unitserialnumber** *array* | *lun*] [-**o**]

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** **-sethost** with **-arraycommpath** modifies one or more communication paths between the server and storage system. It may be needed when there is no LUN owned by an SP through which the host recognizes the storage system and
in the Storage Group through which the host recognizes the storage system. A communication path is a logical path between the host and the storage system.

AX-Series storage systems support only arraycommpath setting 1.

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`.

To discover the current setting of `arraycommpath`, use the `port-list-all` or `port-list-arraycommpath` command.

0

Disables the communication path previously enabled.

1

Enables a communication path.

Example with `arraycommpath`:

```
naviseccli -h ss1_spa storagegroup -sethost -hostname server101 -arraycommpath 1
```

To use this command with `navicli`, replace `naviseccli` with `navicli`.
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 storage systems with Access Logix only. For storage systems without Access Logix, use the command failovermode (see Chapter 3.

To discover the current setting of failovermode, use the port -list -failovermode or port -list -all command.

For information about when to use these failover modes, refer to the EMC Installation Roadmap for CX-Series, AX-Series, and FC-Series Storage Systems, which is on the EMC Powerlink website.

0  
   Failover mode 0.
1  
   Failover mode 1.

AX-Series storage systems support only failover mode setting 1.

2  
   Failover mode 2.
3  
   Failover mode 3.
Example with `failovermode`:
```
naviseccli -h ss1_spa storagegroup -sethost -failovermode 1
-hostname server102
```

To use this command with `navicli`, replace `naviseccli` with `navicli`.

**-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 initiator-type**

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

AX-Series storage systems support only type 0x3.

**-unitserialnumber [array | lun]**

The `unitserialnumber` command displays or sets the VDPP80 behavior mode, which defines how subsequent VPDP80 requests will be populated with the storage-system serial number. You might need to do this for software such as SunCluster 3. You can discover the mode with the `port -list-unitserialnumber` or `port -list-all` command. To set this mode for a host, see `storagegroup -sethost` above.

**array**

Sets the behavior mode to storage system.

**lun**

Sets the behavior mode to LUN.
Access Logix (Storage Group) Commands

Not supported on AX-Series storage systems.

Example with unitserialnumber:
navisecli -h ss1_spa storagegroup -sethost -unitserialnumber lun

To use this command with navicli, replace navisecli with navicli.

storagegroup command, -setpath switch
-setpath [-gname StorageGroupName | -uid StorageGroupUID]
-arraycommpath 0 | 1 | -failovermode 0 | 1 | 2 | 3
-hbauid hbauid | -host hostname | -ip ip-address
-sp a | b | -spport 0 | 1 | -unitserialnumber array | lun | -o

Creates or changes settings for a specific initiator (HBA). You must specify the HBA (-hba switch), SP (-sp), and SP port (-spport). You can identify the Storage Group by name (-gname switch) or unique ID (-uid switch). If you omit both switches, the CLI uses the default path. To obtain -setpath status, use the port list command. The -setpath function has many function switches as follows.

Not supported on AX-Series storage systems.

-arraycommpath 0 | 1

storagegroup -setpath with -arraycommpath modifies one or more communication paths between the server and storage system. It may be needed when there is no LUN owned by an SP through which the host recognizes the storage system and in the Storage Group through which the host recognizes the storage system. The setting should be 0 for ATF.

Changing the arraypath setting forces the storage system to reboot.

This form of -arraycommpath works for storage systems with Access Logix only. For storage systems without Access Logix, use the command arraycommpath (see Chapter 3).
To discover the current setting of **arraycommpath**, use the *port -list -arraycommpath* or *port -list -all* command.

0
Disables the communication path previously enabled. Use this with ATF.

1
Enables a communication path. Do not use with ATF.

Example with **arraycommpath**:
```
naviseccli -h ss1_spa storagegroup -setpath -gname Group1 -hbauid 10:00:00:00:C9:20:DE:0C:10:00:00:00:C9:20:DE:0C -sp a -spport 0 -arraycommpath 1
```

To use this command with **navicli**, replace naviseccli with navicli.

**-failovermode 0 | 1 | 2 | 3**

**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 **EMC Installation Roadmap for CX-Series, AX-Series, and FC-Series Storage Systems**, which is on the EMC Powerlink website.

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 specified the **-o** switch.

This form of **-failovermode** works for one Storage Group. To set the entire storage-system mode, use the command **failovermode**.

To discover the current setting of **failovermode**, use the *port -list -failovermode* or *port -list -all* command.

0
Failover mode 0

1
Failover mode 1

2
Failover mode 2
3
 Failover mode 3

-o
 Executes the command without prompting for confirmation.

Example with failovermode:
naviseccli -h ss1_spa storagegroup -setpath -gname Group1 -hbaid
10:00:00:00:C9:20:DE:0C:10:00:00:00:C9:20:DE:0C
-sp a -spport 0 -failovermode 1

To use this command with navicli, replace naviseccli with navicli.

-name StorageGroupName
 StorageGroupName specifies a user-defined Storage Group name. Use this or the Storage Group unique ID (below).

-hbaid hbauid
 Specifies the HBA unique ID (WWN). Required.

-host [hostname]
 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.

-sp a | b
 Specifies the SP that owns the Storage Group. Required.

-spport 0 | 1
 Specifies the SP port. Required.

-uid StorageGroupUID
 Specifies the Storage Group unique ID.
-unitserialnumber array | lun

Sets the unitserialnumber operation mode. Use this switch if the software instructs you to.

-o

Executes the command without prompting for confirmation.

storagegroup command, -shareable switch

-shareable [-gname StorageGroupName [yes | no] | -uid StorageGroupUID [yes | no]]

Specifies whether more than one host can share the Storage Group. You must use one of the following switches with -shareable, followed by a yes or a no. A yes or no 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 shareable (yes) or not shareable (no).

-uid StorageGroupUID yes | no

Sets the Storage Group with unique ID StorageGroupUID to be shareable (yes) or not shareable (no).

Conventions and Recommendations

None

Example

In the following example, Navisphere connects all of ss1_spa’s HBA-SP combinations to the Storage Group mail.

naviseccli -h ss1_spa storagegroup -gname -connecthost -o

In the next, the -list command displays Storage Group information.

naviseccli -h ss1_spa storagegroup -list

Storage Group Name: Blade 150
Storage Group UID: 34:C7:72:A9:2D:DB:D8:11:AF:5E:08:00:1B:43:73:EE
HBA/SP Pairs:

<table>
<thead>
<tr>
<th>HBA UID</th>
<th>SP Name</th>
<th>SPPort</th>
</tr>
</thead>
<tbody>
<tr>
<td>20:00:00:00:C9:39:40:C7:10:00:00:00:C9:39:40:C7</td>
<td>SP B</td>
<td>0</td>
</tr>
<tr>
<td>20:00:00:00:C9:39:40:C8:10:00:00:00:C9:39:40:C8</td>
<td>SP A</td>
<td>0</td>
</tr>
</tbody>
</table>

HLU/ALU Pairs:
Access Logix (Storage Group) Commands

<table>
<thead>
<tr>
<th>HLU Number</th>
<th>ALU Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>15</td>
</tr>
<tr>
<td>1</td>
<td>14</td>
</tr>
<tr>
<td>2</td>
<td>13</td>
</tr>
<tr>
<td>3</td>
<td>11</td>
</tr>
<tr>
<td>4</td>
<td>10</td>
</tr>
<tr>
<td>5</td>
<td>9</td>
</tr>
<tr>
<td>6</td>
<td>7</td>
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<td>7</td>
<td>6</td>
</tr>
<tr>
<td>8</td>
<td>5</td>
</tr>
<tr>
<td>9</td>
<td>3</td>
</tr>
<tr>
<td>10</td>
<td>2</td>
</tr>
<tr>
<td>11</td>
<td>1</td>
</tr>
</tbody>
</table>

Shareable: YES

The following example creates two Storage Groups, connects them to separate hosts, and adds a LUN to each one.

```
naviseccli -h ss_spa storagegroup -create -gname Production
naviseccli -h ss_spa storagegroup -create -gname Backup
naviseccli -h ss_spa storagegroup -connecthost -o -host ServerABC -gname Production
naviseccli -h ss_spa storagegroup -connecthost -o -host ServerXYZ -gname Backup
naviseccli -h ss_spa storagegroup -addhlu -gname Production -hlu 20 -alu 20
naviseccli -h ss_spa storagegroup -addhlu -gname Backup -hlu 21 -alu 21
```

To use this command with navicli, replace naviseccli with navicli.

**Output**

See the first example above.
This chapter explains the Navisphere Manager CLI commands that manage Navisphere metaLUNs.

Major sections in the chapter are:

- MetaLUNs Overview ................................................................. 5-2
- CLI MetaLUN Command Functions ...................................... 5-4
- metalun -destroy ................................................................. 5-5
- metalun -expand ................................................................. 5-6
- metalun -info ...................................................................... 5-13
- metalun -list ...................................................................... 5-15
- metalun -modify ................................................................. 5-22
- Using the Added Capacity of an Expanded SnapView, MirrorView or SAN Copy LUN ................................................. 5-24
MetaLUNs Overview

A metaLUN is a type of LUN whose maximum capacity is the combined capacities of all the LUNs that compose it. The metaLUN feature lets you dynamically expand the capacity of a single LUN (base LUN) into a larger unit called a metaLUN. You do this by adding LUNs to the base LUN. You can also add LUNs to a metaLUN to further increase its capacity. Like a LUN, a metaLUN can belong to a Storage Group, and can participate in SnapView, MirrorView and SAN Copy sessions. MetaLUNs are supported only on CX-Series and AX-Series storage systems.

During the expansion process, the host has access to any existing data on the LUN or metaLUN, but it does not have access to any added capacity until the expansion is complete. Whether you can actually use the increased user capacity of the metaLUN depends on the operating system running on the servers connected to the storage system.

A metaLUN may include multiple sets of LUNs that are striped together and are independent of other LUNs in the metaLUN. Each set of striped LUNs is called a component. All metaLUNs contain at least one component which includes the base LUN and one or more LUNs. Any data that gets written to a metaLUN component is striped across all the LUNs in the component.

You can expand a LUN or metaLUN in two ways — stripe expansion or concatenate expansion. A stripe expansion takes the existing data on the LUN or metaLUN, and restripes (redistributes) it across the existing LUNs and the new LUNs you are adding. The stripe expansion may take a long time to complete. A concatenate expansion creates a new metaLUN component that includes the new LUNs and appends this component to the end of the existing LUN or metaLUN. There is no restriping of data between the original storage and the new LUNs. The concatenate operation completes immediately.
Figure 5-1 depicts a LUN using stripe expansion to add two LUNs. The result is a metaLUN with a single component consisting of all three LUNs with the data on the base LUN re-striped across all three LUNs.

Figure 5-2 depicts a LUN using concatenate expansion to add two LUNs. The result is a metaLUN with two components. The first component is the base LUN. The second component consists of two new LUNs striped together, but not striped to the first component.

EMC does not recommend that you expand LUN capacity by concatenating LUNs of different RAID types. Do this only in an emergency situation when you need to add capacity to a LUN and you do not have LUNs of the same RAID type or the disk capacity to bind new ones. Concatenating metaLUN components with a variety of RAID types could impact the performance of the resulting metaLUN. Once you expand a LUN, you cannot change the RAID type of any of its components without destroying the metaLUN. Destroying a metaLUN unbinds all LUNs in the metaLUN, and therefore causes data to be lost.
The `naviseccli` or `navicli.jar` metaLUN command functions, listed alphabetically, are

- `metalun -destroy`
- `metalun -expand`
- `metalun -info`
- `metalun -list`
- `metalun -modify`

The CLI metaLUN functions are listed functionally, in the order you would perform them, in the following table.

**Table 5-1 naviseccli or navicli.jar MetaLUN Command Functions, Listed in Order of Use**

<table>
<thead>
<tr>
<th>Essential Functions (in Order Performed)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><code>metalun -expand</code></td>
<td>Creates a metaLUN or expands one</td>
</tr>
<tr>
<td><code>metalun -destroy</code></td>
<td>Destroys a metaLUN and then unbinds all LUNs that were part of the metaLUN</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Optional and Status Functions (Alphabetically)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><code>metalun -info</code></td>
<td>Provides metaLUN information with respect to a specific storage system.</td>
</tr>
<tr>
<td><code>metalun -list</code></td>
<td>Lists the properties of existing metaLUNs</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Optional Reconfiguration Functions (Alphabetically)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><code>metalun -modify</code></td>
<td>Modifies certain metaLUN properties.</td>
</tr>
</tbody>
</table>
metalun -destroy

Destroys a metaLUN and unbinds all LUNs that were part of the metaLUN.

Description

The naviseccli or navicli.jar metalun command with the -destroy switch destroys an existing metaLUN and then unbinds all LUNs that were part of the metaLUN. You will lose all data on the LUNs.

You cannot destroy a metaLUN that belongs to a Storage Group. You must remove the metaLUN from the Storage Group in order to destroy it. You cannot destroy any metaLUNs that are currently participating in a snapshot, clone, mirror or SAN Copy session.

User Access

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

Format

metalun -destroy is used with naviseccli (described on page 2-6) or navicli.jar (described on page 2-31) as follows.

metalun -destroy -metalun number | WWN | [-o]

where

-metalun number | WWN

Specifies the unique number or World Wide Name of the metaLUN you want to destroy. Use only one of the identifiers with the -metalun command. Use the metalun -list command to determine the number or WWN of the metaLUN (see metalun -list on page 5-15).

-o

Executes the command without prompting for confirmation.

Conventions and Recommendations

None.

Example

naviseccli metalun -destroy 20

This command destroys the metaLUN with the number 20.

To use this command with navicli.jar, replace naviseccli with java -jar navicli.jar.

Output

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

**Description**

The naviseccli or navicli.jar metalun command with the `-expand` function creates a new metaLUN or expands the capacity of an existing one. See *Conventions and Recommendations* on page 5-11 for metaLUN requirements.

If you are running a VMware ESX Server, the metaLUN must be configured as a raw device mapping (RDM) volume, set to physical compatibility mode. After you create or expand the metaLUN, you must rescan the bus at the ESX Server level. You can also rescan at the virtual machine level (optional). You then must expand the filesystem at the virtual machine level. The ESX Server and the virtual machine will now recognize the new or expanded metaLUN.

If you will be creating or expanding metaLUNs that are not already configured as raw device mapping volumes, use the VMware vmkfstools utility to reconfigure them. For information on using this utility, refer to the *Managing Raw Device Mappings - Utilities* section found at [www.vmware.com/pdf/esx25_rawdevicemapping.pdf](http://www.vmware.com/pdf/esx25_rawdevicemapping.pdf)

**User Access**

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

**Format:**

`metalun -expand` is used with naviseccli (described on page 2-6) or navicli.jar (described on page 2-31) to create a new metaLUN or expand an existing metaLUN as follows:

To create a new metaLUN, the following command switches are valid:


To expand a metaLUN, the following command switches are valid:

- `metalun -expand -base number | WWN -lus number | WWN [-type C | S] [-sq tb | gb | mb | bc] [-cap number] [-nogrow] [-o]`
where

**-base number | WWN**

Specifies the unique number or World Wide Name of the LUN or metaLUN you want to expand. Use only one of the identifiers with the **-base** switch. Use the **metalun -list** command to determine the number or WWN of the LUN or metaLUN (see **metalun -list** on page 5-15).

When you specify a LUN with the **-base** command, the CLI creates a new metaLUN with the number and WWN of the base LUN. Once the CLI creates the new metaLUN, it assigns a new WWN to the original base LUN and makes it a private LUN. When expanding a single LUN, you can use any or all of the **-expand** switches.

The base LUN can belong to a Storage Group. Expansion LUNs cannot belong to a Storage Group.

When you specify an existing metaLUN with the **-base** command, the CLI expands the capacity of the existing metaLUN. The following switches are not valid during the expansion of an existing metaLUN: **-name, -preservedata, -expansionrate, -defaultowner, -autoassign, -elsz, and -bindoffset**. The expanded metaLUN retains the values of the original metaLUN. After the metaLUN is expanded, use the **metalun -modify** command to change the metaLUN using **-name, -expansionrate, -defaultowner, or -autoassign**. The **-preservedata, -elsz and -bindoffset** values cannot be changed.

**-lus lunnumber | WWN**

Specifies the LUN number or World Wide Name of the LUNs you want to add to the LUN or metaLUN (expansion LUNs). Use only one of the identifiers per LUN with the **-lus** command. Use the **metalun -list** command to determine the number or WWN of the LUNs (see **metalun -list** on page 5-15).

Expansion LUNs cannot be participating in a SnapView (snapshot or clones), MirrorView, or SAN Copy session.
The optional switches are

- **autoassign 0|1** (Not supported on AX-Series)

   Enables or disables autoassign for a metaLUN. Specify 1 to enable autoassign and 0 to disable it. If you do not specify an autoassign value, it defaults to the value of the base LUN.

   Autoassign controls the ownership of the LUN when an SP fails in a storage system with two SPs. With autoassign enabled, if the SP that owns the LUN fails and the server tries to access that LUN through the second SP, the second SP assumes ownership of the LUN to enable access. The second SP continues to own the LUN until the failed SP is replaced and the storage system is powered up. Then, ownership of the LUN returns to its default owner. If autoassign is disabled in the previous situation, the second SP does not assume ownership of the LUN, and access to the LUN does not occur.

   If you are running failover software on a Windows or UNIX server connected to the storage system, you must disable autoassign for all LUNs that you want to fail over to the working SP when an SP fails.

- **bindoffset sector-number** (Not supported on AX-Series)

  Available only if the preservedata switch is set to 0.

  EMC does not recommend using a metaLUN bindoffset value if the base LUN already has one.

  Automatically aligns the logical sector number of the metaLUN to a stripe boundary on the base LUN. The value to enter is the number of sectors by which user data is offset due to file system or partition metadata. Correct application of the bindoffset should result in improved performance. Use a decimal, not hexadecimal, number for sector-number. If you do not specify a bind offset value, it defaults to 0.

- **cap capacity**

  Specifies the capacity of usable space in the metaLUN. The capacity must be smaller than the maximum capacity of the metaLUN components, and greater than or equal to the current capacity (user capacity of the LUN or metaLUN before adding
LUN Expansion (MetaLUN) Commands

LUNs). The default value is the maximum capacity of the metaLUN (total capacity of the existing LUNs and any new LUNs).

If you want to expand a LUN or metaLUN that is participating in a SnapView (snapshot or clone), MirrorView, or SAN Copy session, you must use the -nogrow switch with the -expand -cap command. This command expands the capacity of the LUN or metaLUN to the specified value, but keeps the available user capacity of the base (LUN or metaLUN) the same as it was before adding LUNs. In order for the host to have access to the added capacity, you must wait for the session to complete and then follow the instructions in Using the Added Capacity of an Expanded SnapView, MirrorView or SAN Copy LUN on page 5-24.

-defaultowner A | B

Specifies the SP that will assume ownership of the metaLUN when the storage system is powered up. If you do not specify a default owner, it defaults to the owner of the base LUN.

-elszm elementSizeMultiplier (Not supported on AX-Series)

Sets the stripe element size for a metaLUN component. You determine this by multiplying the stripe size of the first LUN in each component (stripe size of the first LUN = stripe element size of the LUN multiplied by the number of disks in the LUN) by the element size multiplier. Valid multiplier values are 1 through 255. The default multiplier is 40.

EMC recommends that you leave the element size multiplier value at 40.

-expansionrate low | medium | high | ASAP | value

Specifies the relative importance of making additional LUN capacity available to the host. It determines the amount of resources the SP devotes to re-striping the existing data on the original LUNs across the original LUNs and the new LUNs instead of to normal I/O activity. This rate is available only when you first create a metaLUN and is important only for a stripe expansion. Valid rebuild priorities are ASAP (default) or 3, High or 2, Medium or 1, and Low, or 0.

An expansion rate of ASAP or High re-stripes the data across the metaLUN faster than one with Medium or Low priority, but may degrade storage-system performance.

AX-Series systems support only a High expansion rate.
**LUN Expansion (MetaLUN) Commands**

- **-name metaLUN-name**
  Specifies the name of the metaLUN. If you do not specify a name, it defaults to the name of the base LUN.

- **-nogrow**
  Keeps the available user capacity of the metaLUN the same as it was before adding LUNs. You cannot use the added capacity until you change the capacity using the -modify switch.

  For a stripe expansion, any existing data is restriped across the original storage and any new LUNs, but you cannot access the added capacity at this time.

- **-o**
  Executes the command without prompting for confirmation.

- **-preservedata 1 | 0**
  Use with the -type S command (see page 5-11). Allows you to preserve or overwrite any existing data on the base LUN, only if the base LUN is outside a Storage Group.

  You cannot use this command with the -type C switch.

  If the base LUN is outside of a Storage Group, do one of the following:
  
  - Specify 1 to enable stripe expansion and preserve the data on the base LUN. Note that this operation could take a while. The default value is 1.
    
    You must **always** specify 1 when the base LUN is in a Storage Group. CLI returns an error message if you specify 0 in this case.

  - Specify 0 to enable stripe expansion and overwrite the existing data on the base LUN. Note that you will lose the original data on the LUN.

- **-sq tb | gb | mb | bc**
  Specifies the size qualifier for the capacity of the metaLUN component.

  where
  
  tb equals terabytes, gb equals gigabytes, mb equals megabytes and bc equals block count. The default qualifier is block count.
AX-Series systems support only megabyte (mb) and gigabyte (gb) size qualifiers.

-type C | S

Sets the expansion type for the metaLUN to concatenate or stripe. The default expansion type is stripe.

C sets the expansion type to concatenate. A concatenate expansion appends the new LUNs to the end of the base LUN component or metaLUN as a single, separate striped component. There is no striping between the original storage and the new LUNs.

S sets the expansion type to stripe. For a list of requirements for stripe expansion, see Conventions and Recommendations on page 5-11.

If you are expanding a LUN (the base LUN), the -type S switch creates a metaLUN with one component which includes the base LUN and any LUNs that you add. Any data on the base LUN is restriped across the base LUN and the new LUNs.

If the base LUN has existing data, and it is outside of a Storage Group, refer to the -preservedata switch (page 5-10) for additional options.

You can expand only the last component of an existing metaLUN. In this case, the -type S switch restripes any existing data across the original LUNs in the component and any new LUNs that you add. The new LUNs become part of that metaLUN component.

This section describes the general requirements and recommendations for both a stripe and concatenate expansion, as well as those specific to one or the other.

General Expansion Requirements and Recommendations

- All LUNs within a metaLUN must be either a redundant (RAID 5, RAID 3, RAID 1, RAID 1/0) or non-redundant (RAID 0, Disk) RAID type.
- All disks within metaLUN must be the same type (ATA or Fibre Channel).
- You can expand only the last component of a metaLUN.
Expansion LUNs cannot be participating in a SnapView, MirrorView or SAN Copy session.

**Stripe Expansion Requirements and Recommendations**
- All LUNs within a striped metaLUN or metaLUN component must be the same size and RAID type, and EMC recommends that each LUN
  - be from a different RAID Group.
  - includes the same number of disks.
  - has the same stripe element size.

**Concatenate Expansion Requirements and Recommendations**
- All LUNs within a concatenated metaLUN component must be the same size and RAID type, but can differ from the size and RAID type of LUNs within other components.

EMC does not recommend that you expand LUN capacity by concatenating LUNs of different RAID types. Do this only in an emergency situation when you need to add capacity to a LUN and you do not have LUNs of the same RAID type or the disk capacity to bind new ones. Concatenating metaLUN components with a variety of RAID types could impact the performance of the resulting metaLUN. Once you expand a LUN, you cannot change the RAID type of any of its components without destroying the metaLUN. Destroying a metaLUN unbinds all LUNs in the metaLUN, and therefore causes data to be lost.

**Example**
```
naviseccli metalun -expand -base 20 -lus 42 -name newMetaLUN
```
This command creates a metaLUN with the name **newMetaLUN**, which consists of which includes base LUN 20 and LUN 42. Since the default expansion type is stripe, this metaLUN is striped.

To use this command with navicli.jar, replace naviseccli with java -jar navicli.jar.

**Output**
None if the command succeeds; status or error information if it fails.
**metalun -info**

Provides general information about a storage system’s metaLUN environment

**Description**

The `naviseccli` or `navicli.jar metalun` command with the `-info` function and no other options displays all general information about the metaLUN environment for a storage system. Issuing this command with one or more options displays the information based on the options issued.

**User Access**

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

**Format**

`metalun -info` is used with `naviseccli` (described on page 2-6) or `navicli.jar` (described on page 2-31) as follows.


where

- **-canexpand**
  
  Specifies whether you can or cannot expand any LUNs or metaLUNs on the storage system. - Yes or No.

- **-nummetaluns**
  
  Displays the number of metaLUNs in the storage system.

- **-maxmetaluns**
  
  Displays the maximum number of metaLUNs that the storage system will support (based on storage-system type). See the CLI release notes for currently supported values.

- **-maxcomponents**
  
  Displays the maximum number of components allowed per metaLUN for this storage system (based on storage-system type). See the CLI release notes for currently supported values.

- **-maxluns**
  
  Displays the maximum number of LUNs per component that this storage system supports (based on storage-system type). See the CLI release notes for currently supported values.
LUN Expansion (MetaLUN) Commands

-availableluns

Lists all LUNs (by LUN number) in the storage system that are available for expansion.

-lunsinmeta

Lists any LUNs (by LUN number) in the storage system that are part of a metaLUN.

Conventions and Recommendations

None.

Example

naviseccli -address 10.14.20.57 metalun -info

This command requests information about the metaLUN environment for the storage system with SP 10.14.20.57.

To use this command with navicli.jar, replace naviseccli with java -jar navicli.jar.

Output

Can a LUN or a Meta-LUN be expanded on this system: Yes
Number of Meta-LUNs in the system: 7
Maximum Number of Meta-LUNs per system: 1024
Luns that are participating in Meta-LUNs: 513 512 515 514 517 516 519 518 521 52 0 523 522 525 524
Luns that are available for expansion: 32 43 44 47 48 49 50 51 52 53 54 55 56 57 58 59 0
Maximum Number of Components per Meta-LUN: 8
Maximum Number of LUNs per Component: 16

The CLI returns status or error information if the command fails.
metalun -list

Lists the properties of existing metaLUNs

**Description**
The `navisecli` or `navicli.jar metalun` command with the `-list` function and no other options lists all property information for all metaLUNs on a storage system. Issuing this command with one or more options displays the information based on the options issued.

In order to return values for performance data, you must enable statistics logging for each SP in the storage system. Use Navisphere CLI or Navisphere Manager. Performance data switches are marked with an asterisk (*)

If you request performance data for a specific metaLUN, make sure that you enter the IP address for the SP that is the current owner of the metaLUN.

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

**Format**

`metalun -list` is used with `navisecli` (described on page 2-6) or `navicli.jar` (described on page 2-31) as follows.


where

- `-name [metaLUN-name]`
  Lists all information for that specific metaLUN.
  Issuing the `-name` command without a `metaLUN-name` displays the names of all metaLUNs on the storage system.

- `-metalunwwn metaLUN-WWN`
  Lists all information for that specific metaLUN
  Issuing the `-metalunwwn` command without a `metaLUN-WWN` displays the WWNs for all metaLUNs on the storage system.
-metalunnumber metaLUN-number

Lists all information for that specific metaLUN.

Issuing the -metalunnumber command without a metaLUN-number displays the numbers for all metaLUNs on the storage system.

The optional switches are

-actualusercap

Displays the current user capacity of all metaLUNs on the storage system.

Issuing the -actualusercap command with a metaLUN name, number or WWN displays the user capacity for that specific metaLUN.

-autoassign

Displays the current state of the autoassign feature for all metaLUNs on the storage system (Yes or No).

Issuing the -autoassign command with a metaLUN name, number or WWN displays the current state of the autoassign feature for that specific metaLUN.

-bindoffset

Aligns the logical sector number of all metaLUNs on the storage system to a stripe boundary on the base LUN (see page 5-8).

Issuing the -bindoffset command with a metaLUN name, number or WWN returns the value of the bindoffset used for that metaLUN.

-brw*

Displays the number of host block read and write requests to all metaLUNs on the storage system.

Issuing the -brw command with a metaLUN name, number or WWN displays the number of host block read and write requests to that specific metaLUN.
LUN Expansion (MetaLUN) Commands

-**components**
  Displays the contents of all components in all metaLUN on the storage system.

  Issuing the `-components` command with a metaLUN name, number or WWN displays the contents of all components for that specific metaLUN.

-**currentowner**
  Lists the current SP owner of all metaLUNs in the storage system.

  Issuing the `-currentowner` command with a metaLUN name, number or WWN lists the current SP owner of the specified metaLUN.

--**canexpand**
  Displays the ability of all metaLUN on the storage system to be expanded - Yes or No

  Issuing the `-canexpand` command with a metaLUN name, number or WWN lists the ability of the specified metaLUN to be expanded - Yes or No

-**defaultowner**
  Lists the default SP owner of all metaLUNs on the storage system.

  Issuing the `-defaultowner` command with a metaLUN name, number or WWN lists the default SP owner of the specified metaLUN.

-**drivetype**
  Displays the drive type for all metaLUNs on the storage system - ATA or Fibre Channel.

  Issuing the `-drivetype` command with a metaLUN name, number or WWN displays the drive type for the specified metaLUN - ATA or Fibre Channel.

-**expansionrate**
  Displays the expansion rate for all metaLUNs on the storage system (see page 5-9). Valid values are 0 (Low), 1 (Medium), 2 (High), 3 (ASAP), or N/A if the metaLUN is not currently expanding.
Issuing the `-expansionrate` command with a metaLUN name, number or WWN displays the expansion rate for the specified metaLUN (see page 5-9).

- `elszm`

Displays the element size multiplier for all metaLUNs on the storage system (see page 5-9).

Issuing the `-elszm` command with a metaLUN name, number or WWN displays the element size multiplier for the specified metaLUN (see page 5-9).

- `isredundant`

Displays the redundancy of all metaLUNs on the storage system - Yes if it is redundant; No if it is not redundant.

Issuing the `-elszm` command with a metaLUN name, number or WWN displays the redundancy of the specified metaLUN - Yes if it is redundant; No if it is not redundant.

- `percentexp`

Displays the percent complete of the stripe expansion process of all base LUNs or metaLUNs on the storage system.

Issuing the `-percentexp` command with a metaLUN name, number or WWN displays the percent complete of the stripe expansion process of the specified base LUN or metaLUN.

- `rhist*`

Returns read histogram information for all metaLUNs on the storage system.

A 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 $2^n - 1$ and less than $2^n$ blocks in size. For example, the first bucket contains the number of 1 block reads, the second contains the number of 2-3 block reads, the third contains the number of 4-7 block reads, and so on. The `-rhist` switch also displays the number of read histogram overflows, which are the number of reads that were larger than 512 blocks.

Issuing the `-rhist` command with a metaLUN name, number or WWN returns the read histogram for the specified metaLUN.
-rwr*

Displays the number of host read and write requests to all metaLUNs on the storage system.

Issuing the -rwr command with a metaLUN name, number or WWN displays the number of host read and write requests to the specified metaLUN.

-state

Displays the current state of all metaLUNs on the storage system.

When issuing the -state command with a metaLUN name, number or WWN displays the state of the specified metaLUN.

<table>
<thead>
<tr>
<th>Table 5-2 Valid MetaLUN States</th>
</tr>
</thead>
<tbody>
<tr>
<td>State</td>
</tr>
<tr>
<td>------------------</td>
</tr>
<tr>
<td>Normal</td>
</tr>
<tr>
<td>Degraded</td>
</tr>
<tr>
<td>Shut down</td>
</tr>
<tr>
<td>Expanding</td>
</tr>
</tbody>
</table>

-totalcap

Displays the total available capacity of all metaLUNs on the storage system.

Issuing the -totalcap command with a metaLUN name, number or WWN displays the total available capacity of the specified metaLUN.

-whist*+

Returns write histogram information for all metaLUNs on the storage system.
A write histogram is an array of 10 locations that contain the number of writes. Element $n$ of the array contains the number of writes that were larger than or equal to $2^n-1$ and less than $2^n$ blocks in size. For example, the first bucket contains the number of 1 block writes, the second contains the number of 2-3 block writes, the third contains the number of 4-7 block writes, and so on. The -whist switch also displays the number of write histogram overflows, which are the number of writes that were larger than 512 blocks.

Issuing the -whist command with a metaLUN name, number or WWN returns the write histogram for the specified metaLUN.

None.

**Example**

```bash
naviseccli -address 10.14.20.57 metalun-list
```

This command requests information on all metaLUNs that are currently owned by the SP with IP address 10.14.20.57.

To use this command with navicli.jar, replace naviseccli with java -jar navicli.jar.

**Output**

```
Meta-LUN Name: LUN10
Meta-LUN WWN:
  60:06:01:6D:35:0A:00:00:FC:35:5B:8C:66:60:D7:11
Meta-LUN Number: 30
Default Owner: SP A
Current Owner: SP B
Meta-LUN State: ENABLED
Can MetaLUN Be Expanded: Yes
Expansion Rate: MEDIUM
Percent Expanded: 0
Total Capacity (Blocks/Megabytes): 819200/400
Actual User Capacity (Blocks/Megabytes): 819200/400
Autoassign: No
Is Redundant: Yes
Drive Type: Fibre Channel
Element Size Multiplier: 40
Bind Offset: 0
Read Histogram [0] : 22
Read Histogram [1] : 14
Read Histogram [2] : 19
Read Histogram [3] : 37
Read Histogram [5] : 0
Read Histogram [6] : 0
Read Histogram [7] : 0
```
Read Histogram [8] : 0
Read Histogram [9] : 0
Read Histogram Overflows: 45
Write Histogram [0] : 22
Write Histogram [1] : 22
Write Histogram [5] : 22
Write Histogram [7] : 22
Write Histogram [8] : 22
Write Histogram [9] : 22
Write Histogram Overflows: 45
Read Requests: 0
Write Requests: 0
Blocks Read: 0
Blocks Written: 0
Components:
Number of LUNs: 2
LUNs:
LUN Number: 513
LUN Name: LUN 30
LUN WWN: 60:06:01:72:35:0A:00:00:B0:44:01:4B:61:60:D7:11
RAID Type: RAID5
LUN Number: 512
LUN Name: LUN 31
LUN WWN: 60:06:01:72:35:0A:00:00:15:FB:3B:4C:61:60:D7:11
RAID Type: RAID5
Number of LUNs: 1 (Lists LUN information for second component)

The CLI returns status or error information if the command fails.
**metalun -modify**

Modifies certain properties of an existing metaLUN

**Description**
The `naviseccli` or `navicli.jar metalun` command with the `-modify` function lets you edit certain properties of a specified metaLUN. You must specify either the number or WWN for the metaLUN, and you must specify at least one other switch.

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

**Format**
`metalun -modify` is used with `naviseccli` (described on page 2-6) or `navicli.jar` (described on page 2-31) as follows.

```
metalun -modify metalun number | WWN [-autoassign 0 | 1]
[-cap capacity] [-defaultowner A | B]
[-expansionrate low | medium | high | ASAP | value]
[-newname newName] [-o] [-sq tb | gb | mb | bc] [-tomaxcap]
```

where

- **metalun number | WWN**
  Specifies the number or WWN of the metaLUN whose properties you want to change.

The optional switches are

- **-autoassign 1 | 0** (Not supported on AX-Series)
  Enables or disables auto assign for a metaLUN. Specify 1 to enable auto assign and 0 to disable it. If you do not specify an auto assign value, it defaults to the value of the base LUN. For more information about auto assign, see page 5-8.

- **-cap capacity**
  Specifies the capacity of usable space in the metaLUN. The capacity must be smaller than the maximum capacity of the metaLUN, and greater than or equal to the current capacity (user capacity of the LUN or metaLUN before adding LUNs).

If you want to modify the user capacity of a LUN or metaLUN that is participating in a SnapView (snapshot or clone), MirrorView or SAN Copy session, see *Using the Added Capacity of an Expanded SnapView, MirrorView or SAN Copy LUN* on page 5-24.
LUN Expansion (MetaLUN) Commands

-defaultowner A | B

Specifies the new default SP owner for the metaLUN — A or B.

-expansionrate low | medium | high | ASAP | value

Specifies the relative importance of making additional LUN capacity available to the host. It determines the amount of resources the SP devotes to re-stripping the existing data on the original LUNs across the original LUNs and the new LUNs instead of to normal I/O activity. This rate is available only when you first create a metaLUN and is important only for a stripe expansion. Valid rebuild priorities are ASAP (default) or 3, High or 2, Medium or 1, and Low, or 0.

An expansion rate of ASAP or High re-stripes the data across the metaLUN faster than one with Medium or Low priority, but may degrade storage-system performance.

AX-Series systems support only a High expansion rate.

-newname newName

Specifies the new name for the metaLUN. A valid name must not exceed 64 characters and must include at least one non-whitespace character. This name must be unique on the storage system.

-o

Executes the command without prompting for confirmation.

-sq tb | gb | mb | bc

Specifies the size qualifier for the capacity of the metaLUN component.

where

tb equals terabytes, gb equals gigabytes, mb equals megabytes and bc equals block count. The default qualifier is block count.

AX-Series systems support only megabyte (mb) and gigabyte (gb) size qualifiers.

-tomaxcap

Lets you expand the metaLUN to its maximum capacity.
Using the Added Capacity of an Expanded SnapView, MirrorView or SAN Copy LUN

You can expand the capacity of a LUN or metaLUN that is currently participating in a SnapView, MirrorView or SAN Copy session (see `naviseccli metalun -destroy 20` on page 5-5), but the host cannot access the added capacity until the expansion is complete, and you perform any or all of the following operations:

For a stripe expansion, any existing data is restriped across the original LUN or metaLUN and the added LUNs during the SnapView, MirrorView or SAN Copy session. This restriping is invisible to the host.

For LUNs in a SnapView Session

To access the added capacity of an expanded snapshot source LUN, do the following:

1. Stop all SnapView sessions and destroy all snapshots associated with the expanded source LUN (see the admsnap, the online help or the SnapView Administrator’s Guide).

2. Use the `metaLUN -modify` command on page 5-22 to change the capacity of the expanded LUNs.

3. Make sure the host operating system can utilize the added capacity.

4. You can now start new sessions and create new snapshots with the expanded LUNs (see the SnapView CLI Reference, the online help or the SnapView Administrator’s Guide).
For LUNs in a Clone Group

You must expand the clone and the clone source LUN to the same size.

To access the added capacity of an expanded clone, or clone source LUN, do the following:

1. For the clone, remove the clone from the clone group; for a clone source LUN, destroy the clone Group.
2. Use the `metaLUN -modify` command on page 5-22 to change the capacity of the expanded LUNs.
3. Make sure the host operating system can utilize the added capacity.
4. Reconstruct the clone group with the expanded LUNs and then perform a full synchronization of the LUNs in the clone group.

For LUNs in Mirrors

You must expand both the primary and secondary images of a mirror to the same size.

To access the added capacity of an expanded primary and secondary MirrorView LUN, do the following:

1. For the expanded primary image, destroy the mirror; for the expanded secondary image, remove it from the mirror (see the `MirrorView CLI Reference`, the online help or the `MirrorView Administrator’s Guide`)
2. Use the `metaLUN -modify` command on page 5-22 to change the capacity of the expanded LUNs.
3. Make sure the host operating system can utilize the added capacity.
4. Reconstruct the mirror with the expanded LUNs and then perform a full synchronization of the mirror.
LUN Expansion (MetaLUN) Commands

For LUNs in SAN Copy Sessions

If you expand the SAN Copy source logical unit, make sure that the destination LUNs are of equal or greater capacity.

To access the added capacity of an expanded SAN Copy source LUN or destination LUN, do the following:

1. For any sessions that the expanded LUNs are participating in, wait until the SAN copy sessions complete, or stop the sessions, and then remove these sessions. (see the online help, or the SAN Copy Administrator’s Guide).

2. Use the `metaLUN -modify` command on page 5-22 to change the capacity of the expanded LUNs.

3. Make sure the host operating system can utilize the added capacity.

4. Reconstruct the SAN Copy sessions that you removed and then, when you are ready, start the sessions. (see the online help, or the SAN Copy Administrator’s Guide).
This chapter explains how to configure the reserved LUN pool, which is required for running replication software such as SnapView. It also describes the CLI commands that you can use if SnapView is installed on your system.

Major sections are

- Introduction to the Reserved LUN Pool ........................................... 6-2
- Estimating the Reserved LUN Pool Size ........................................... 6-3
- reserved -lunpool -addlun .............................................................. 6-5
- reserved -lunpool -list ................................................................. 6-7
- reserved -lunpool -rmlun ............................................................... 6-9
Reserved LUN Pool Commands

Introduction to the Reserved LUN Pool

The reserved LUN pool works with replication software, such as SnapView and SAN Copy, to store data or information required to complete a replication task. The reserved LUN pool consists of one or more private LUNs, and each SP has its own reserved LUN pool. Since the LUNs in the reserved LUN pool are private LUNs, they cannot belong to Storage Groups and a host cannot perform I/O to them.

Before starting a replication task, the reserved LUN pool must contain at least one LUN for each source LUN that will participate in the task. You can add any LUNs that are available to either SP’s reserved LUN pool. Each SP manages its own LUN pool space and assigns a separate reserved LUN (or multiple LUNs) to each source LUN. All replication software that uses the reserved LUN pool shares the resources of the reserved LUN pool. For example, if you are running an incremental SAN Copy session on a LUN that belongs to SP A and a SnapView session on another LUN that belongs to the same SP, the reserved LUN pool for SP A must contain at least two LUNs - one for each source LUN. If both sessions are running on the same source LUN, the sessions will share a reserved LUN.

Allocation of Reserved LUNs

Each SP manages its own reserved LUN pool space and allocates reserved LUNs on a per-source-LUN basis, not a per-session basis. For example, if two sessions are running on a source LUN, the SP assigns reserved LUNs, as needed, to the source LUN, and both sessions share these LUNs.

The assignment of reserved LUNs is based upon the first available free LUN in the SP’s LUN pool. An adequate number of reserved LUNs is essential because the software will terminate sessions if no free LUNs are available in the SP’s LUN pool. If you are running multiple sessions per source LUN and your reserved LUN fills up (runs out of space) and no free LUNs are available in the SP’s LUN pool, the session that is trying to allocate a reserved LUN from this pool will terminate.
How SPs Manage the Reserved LUN Pool

When you start the first session on a source LUN, Navisphere Manager assigns reserved LUNs from the LUN pool of the SP that currently owns the source LUN. All subsequent sessions started on this source LUN will use reserved LUNs from the same SP’s LUN pool, even if the source LUN trespasses to the peer SP (unless you stop all sessions on the trespassed source LUN).

For example, if you start the first session on a source LUN that belongs to SP A, and the source LUN is trespassed to SP B, the reserved LUNs assigned to this source LUN also trespass to SP B. If you start a second session on the trespassed source LUN (which now belongs to SP B), the second session will still use SP A’s reserved LUNs and not SP B’s. If, however, you stop all sessions on the trespassed source LUN, and then start a new session on this LUN, the new session uses reserved LUNs from SP B’s LUN pool, not SP A’s.

Estimating the Reserved LUN Pool Size

Each reserved LUN can vary in size. However, using the same size for each LUN in the pool is easier to manage because Navisphere Manager assigns reserved LUNs without regard to size; that is, it assigns the first available free LUN in the SP’s reserved LUN pool. Since you cannot control which reserved LUNs it uses for a particular session, EMC recommends that you use more, smaller reserved LUNs. By doing this, Manager is better able to allocate the reserved LUN space. If a session requires additional reserved LUN space, it dynamically assigns a free reserved LUN from the SP’s LUN pool.

Before binding LUNs for the reserved LUN pool, think about which source LUNs will participate in a session. The size of these LUNs will help you estimate a suitable size for the LUNs in the reserved LUN pool size.
Reserved LUN Pool Commands

Estimating a Suitable Reserved LUN Pool Size

To help determine the size of the reserved LUN pool and the reserved LUNs, do the following:

1. Add the total size of source LUNs in SP A or SP B.
2. Multiply that number by 10%. This value is the reserved LUN pool usage.
3. Multiply the reserved LUN pool usage amount by two (this is a buffer for any unanticipated I/O to the source LUN(s)).
   The result is a reasonable estimate for the size of the reserved LUN pool.
4. To determine the size of each reserved LUN, divide the reserved LUN pool size by two times the number of source LUNs. The result is the size of each reserved LUN per session.

To protect your sessions from being terminated (if no free reserved LUNs were available in the pool), the number of reserved LUNs in the pool should always be two times the number of source LUNs.

In addition to using the size of the source LUN to determine a suitable size for the reserved LUN pool, you may want to consider the duration time for the replication session in your calculations. A longer duration time could increase the need for more reserved LUN pool space since it is possible that more areas will be written to over a longer period of time.
Reserved LUN Pool Commands

reserved -lunpool -addlun

Adds a LUN to the reserved LUN pool

Description
The naviseccli or navicli reserved command with the -lunpool and -addlun functions adds one or more LUNs to the reserved LUN pool. Each SP has its own reserved LUN pool, and before starting a session, the reserved LUN pool must contain at least one LUN for each source LUN that will be participating in a session.

Sessions include SnapView sessions and any reserved sessions for use in another application.

When you add a LUN to the pool, you allocate each LUN to either SP A’s or SP B’s reserved LUN pool. Each SP manages its own LUN pool space and assigns a separate reserved LUN (or multiple LUNs) to each source LUN.

You must bind the LUN before you can add it to the reserved LUN pool. While a LUN is part of the reserved LUN pool, you cannot use it for any other purpose.

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

For navicli, you must have a user entry in the Navisphere agent configuration file.

Format
reserved -lunpool -addlun is used with naviseccli (described on page 2-6) or navicli (described on page 2-20) as follows:

reserved -lunpool -addlun lun_numbers

where

lun_numbers

Specifies the logical unit number(s) to add to the reserved LUN pool.

Conventions and Recommendations
None.
Reserved LUN Pool Commands

Example

```bash
naviseccli -h ss1_spa reserved -lunpool -addlun 11
```

For SP `ss1_spa`, this command adds the LUN with ID 11 to SP A’s reserved LUN pool.

To use this command with `navicli`, replace `naviseccli` with `navicli`.

Output

If the version of software running on the SP does not support this command, a `Command is not supported` error message is printed to `stderr`.
**reserved -lunpool -list**

Displays reserved LUN pool information

**Description**
The `naviseccli` or `navicli reserved` command with the `-lunpool` and `-list` functions and no other switches lists all information about the reserved LUN pool. You can obtain more specific information with function switches.

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

For `navicli`, you must have a username/host entry in the Navisphere SP Agent configuration file.

**Format**
`reserved -lunpool -list` is used with `naviseccli` (described on page 2-6) or `navicli` (described on page 2-20) as follows:

```
```

where

- **-allocatedluns**
  Displays the LUN IDs of all allocated LUNs in the reserved LUN pool.

- **-chunksize**
  Displays the number of disk blocks in the reserved LUN pool, in Kbytes. The chunk size applies to both SPs.

- **-freeluncount**
  Displays the total number of unallocated LUNs in the LUN pool.

- **-freeluns**
  Displays the LUN IDs of all unallocated LUNs in the reserved LUN pool.

- **-freesize**
  Displays the total size of unallocated LUNs in Gbytes.

- **-luncount**
  Displays the total number of LUNs in the reserved LUN pool.

You can add LUNs with the `reserved -lunpool -addlun` functions.
Reserved LUN Pool Commands

- **percentused**
  Displays the percentage of the reserved LUN pool that is used.

- **size**
  Displays the size of the reserved LUN pool in Gbytes.

- **used**
  Displays the space used in the reserved LUN pool, in Gbytes.

**Conventions and Recommendations**
None.

**Example**
```bash
naviseccli -h ss1_spa reserved -lunpool -list
```
This command displays the reserved LUN pool information for SP `ss1_spa`. A sample output follows.

To use this command with `navicli`, replace `naviseccli` with `navicli`.

**Output**

The following is a sample output that shows the devices controlled by one Agent. Actual output varies depending on the switches you use with the `-lunpool -list` command.

You can only display reserved LUN pool information for the SP you direct the command to.

<table>
<thead>
<tr>
<th>Name of the SP:</th>
<th>SP A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Number of LUNs in Pool:</td>
<td>9</td>
</tr>
<tr>
<td>Number of Unallocated LUNs in Pool:</td>
<td>4</td>
</tr>
<tr>
<td>Unallocated LUNs:</td>
<td>14, 24, 23, 22</td>
</tr>
<tr>
<td>Allocated LUNs:</td>
<td>16, 17, 18, 20, 21</td>
</tr>
<tr>
<td>Total size in GB:</td>
<td>4.488281</td>
</tr>
<tr>
<td>Unallocated size in GB:</td>
<td>1.292969</td>
</tr>
<tr>
<td>Used LUN Pool in GB:</td>
<td>0.017639</td>
</tr>
<tr>
<td>% Used of LUN Pool:</td>
<td>0.393005</td>
</tr>
<tr>
<td>Chunk size in disk blocks:</td>
<td>128</td>
</tr>
</tbody>
</table>

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

---

EMC Navisphere Command Line Interface (CLI) Reference
Reserved LUN Pool Commands

**reserved -lunpool -rmlun**

Removes one or more LUNs from the reserved LUN pool

**Description**
The navisecli or navicli reserved command with the -lunpool and -rmlun functions removes one or more LUNs from the reserved LUN pool. If you omit the override option, the CLI prompts for confirmation before removing the LUN from reserved LUN pool.

**User Access**
For navisecli, you must have a user account on the storage system on which you want to execute the command.

For navicli, you must have a username/host entry in the Navisphere SP Agent configuration file.

**Format**
reserved -lunpool -rmlun is used with navisecli (described on page 2-6) or navicli (described on page 2-20) as follows:

```plaintext
reserved -lunpool -rmlun luns [-o]
```

where

- **-o**
  Executes the command without prompting for confirmation.

- **-rmlun luns**
  Specifies the LUN ID of each LUN, with the IDs separated by blanks, you want to remove from the reserved LUN pool.

**Conventions and Recommendations**
None.

**Example**
navisecli -h ss1_spa reserved -lunpool -rmlun 42

For SP ss1_spa, this command starts removing LUN 42 from the reserved LUN pool. The software asks for confirmation:

Do you really want to remove the luns from LUN pool. (y/n) [N]?

y

To use this command with navicli, replace navisecli with navicli.
Reserved LUN Pool Commands

**Output**

If the version of software running on the SP does not support this command, a `Command is not supported` error message is printed to `stderr`. 
This chapter explains each of the `navisecli` or `navicli.jar` iSCSI commands; that is, the CLI commands that are common to all CLARiiON iSCSI disk-array storage systems.

Major sections are

- About iSCSI Storage Systems in IP Networks .........................7-2
- Using iSNS (Internet Storage Naming Service) within an iSCSI Storage Environment.........................................................7-5
- iSCSI Commands Overview....................................................7-7
- `connection -adduser` ..............................................................7-8
- `connection -deleteuser` .........................................................7-10
- `connection -getuser` ..............................................................7-12
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- `isns -addserver` .................................................................7-21
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About iSCSI Storage Systems in IP Networks

An iSCSI storage system, such as the CX500i, connects directly to an IP network. Servers with either iSCSI HBAs (host bus adapters) or Ethernet connections can access the iSCSI storage system through an IP network, such as a local-area network (LAN).

A LAN is a set of point-to-point connections between nodes, with each node having its own unique IP address. Connections are made through one or more network components such as switches or hubs. Nodes are connected through a LAN by Ethernet CAT 6 (for Gigabit Ethernet LAN) and CAT 5 (for 10/100 LAN) copper cables. Network switches are not nodes.

Each node in an iSCSI environment is either an initiator (server) or a target (storage system). Figure 7-1 shows an initiator node and a target node.

Figure 7-1 Nodes - Initiator and Target

Before a server is able to initiate server I/O to the iSCSI storage system, it must be configured as follows:

- You have installed one of the following interface cards and relevant drivers:
  - Supported iSCSI HBA cards that have a driver and configuration tool (for example, Qlogic), or
  - Gigabit Ethernet Network Interface Cards (NICs) running Microsoft software that provides HBA functionality.
We support 10-Mbit, 100-Mbit, and 1000-Mbit Gigabit Ethernet (GigE) interfaces, but the storage system only supports 1000-Mbit. If your NIC does not run GigE, then you need to connect to the storage system using a GigE router or switch.

- You have cabled the storage system properly (refer to the Setup Guide, P/N 300-001-924, that shipped with the storage system).
- You have installed the Navisphere Utilities on each server with access to data on the storage system (refer to the Setup Guide).
- You have installed PowerPath software on the servers for multi-pathing (refer to the Setup Guide).
- You have set the Network parameters and security for the SP management ports on the storage system.

The iSCSI interface uses CHAP (Challenge Handshake Authentication Protocol) to protect the storage system’s iSCSI ports from unwanted access. CHAP is optional, but if your storage system might be accessed from a public IP network, we strongly recommend that you use CHAP security.

CHAP is a method for authenticating iSCSI users (initiators and targets). The iSCSI storage system can use CHAP to authenticate server initiators and initiators can authenticate targets such as the storage system. To use CHAP security, you must configure CHAP credentials for the storage system iSCSI ports and any servers that will access the storage system data.

If you will be using CHAP security, we strongly recommend that you configure it on both the storage system and the server before initiating server I/O.

Figure 7-2 illustrates an iSCSI storage system in a storage domain with various servers and illustrates how iSCSI storage systems differ from Fibre Channel storage systems.
Figure 7-2  FC and iSCSI Storage Systems in an IP Network
Using iSNS (Internet Storage Naming Service) within an iSCSI Storage Environment

iSNS (Internet Storage Naming Service) is supported only on Windows platforms that are part of an iSCSI network configuration.

The iSNS service provides the same function for TCP/IP storage networks as the Simple Name Server (SNS) service in a Fibre Channel fabric — automated discovery, management and configuration of iSCSI devices. It eliminates the need to manually configure each individual storage device with its own list of initiators and targets. Once configured, the iSNS server assumes responsibility for the discovery and management of iSCSI devices.

The iSNS service includes an iSNS server component and iSNS client components. The iSNS server must reside somewhere within the IP storage network, for example, in the switch firmware, or on a host. An iSNS client resides on both the iSCSI storage system and any iSCSI hosts connected to the storage system. When you start the storage system, the iSNS client on the storage system gathers all the storage system’s iSCSI port information and stores it locally on the storage system. When you add a server to the storage system’s iSNS configuration, Navisphere establishes a connection from the storage system to the iSNS server, and then registers all the stored information on the storage system with the iSNS server.

To use the features of the iSNS service in an iSCSI storage environment:

- all the iSCSI requirements listed in the section, About iSCSI Storage Systems in IP Networks on page 7-2, must be met;
- an iSNS server must be running on a network to which the storage system has access;
- the host initiators or HBAs must be able to use the iSNS service;
- the storage system must support the iSNS service;
- the iSNS server must be able to communicate with the storage system.
The following illustration represents a sample iSNS configuration. In this configuration, the management and storage networks are separate. The management station is used to configure both the iSNS servers and the storage system (using Navisphere Manager). The iSNS servers are also connected to the storage network so that the clients may query them for target information. The storage system uses either the storage or the management network to register its targets (ports) with the iSNS servers.

Figure 7-3  Sample iSNS Storage Configuration
iSCSI Commands Overview

The `navisecclicl` or `navicli.jar` iSCSI commands in this chapter include the connection and iSNS commands. The following table identifies the iSCSI commands that can be used.

Table 7-1  `navisecclicl` or `navicli.jar` iSCSI Commands

<table>
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<th>Description</th>
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</tr>
<tr>
<td>isns -deleteserver</td>
<td>Deletes an iSNS server from a storage system's iSNS service configuration</td>
</tr>
<tr>
<td>isns -listserver</td>
<td>Displays all iSNS servers that are configured in the storage system's iSNS service</td>
</tr>
<tr>
<td>isns -setprimary</td>
<td>Sets a configured iSNS server as the primary server for a storage system's iSNS service</td>
</tr>
</tbody>
</table>
connection -adduser

Add a CHAP authentication user

**Description**
The `naviseccli` or `navicli.jar` connection command with the `adduser` function adds either an initiator CHAP authentication user or a target (storage system) CHAP authentication user to the storage system CHAP user database.

If you try to create a CHAP user for an initiator and the user is already defined, an error message is returned that the user is already defined for the initiator.

If you try to add a user for a target and the user is already defined, an error is returned that only one user can be defined for target access.

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

**Format**
`connection -adduser` is used with `naviseccli` (described on page 2-6) or `navicli.jar` (described on page 2-31) as follows.

```
connection -adduser -definedFor initiator | target -initiatorName initiatorName [-userName username] -secret secret [-hexsecret] [-o]
```

where

- **-definedFor initiator | target**
  - `initiator` adds an initiator CHAP user account to the storage system user database. If you specify `initiator`, you must specify an initiator using the `-initiatorName` parameter.
  - `target` specifies that a target (storage system) CHAP user account will be created. If you specify `target`, do not use the `-initiatorName` parameter.

- **-initiatorName initiatorName**
  - If `initiator` user account data is being added, `initiatorName` is a unique identifier for the initiator and uses the iSCSI Qualified Name (IQN) of the iSCSI initiator. This parameter is required if you are defining an initiator user.

- **-userName username**
  - If `initiator` user account data is being added, `username` specifies the CHAP username that the initiator uses when connecting to an
iSCSI target. For CHAP, a **username** and **secret** must be defined for each initiator. If the `-userName` parameter is omitted, it defaults to the `-initiatorName` value. If a target is being configured for mutual CHAP, the target name becomes the **username**.

**-secret secret**

If initiator user account data is being added, `secret` specifies the CHAP secret (password) that the storage system will use to authenticate the initiator. You can specify the secret in ASCII or hexadecimal characters (see the `-hexsecret` switch that follows). By default, `-secret` is an ASCII string. ASCII secrets must consist of at least 12 and no more than 16 characters. Hexadecimal secrets must consist of at least 12 and no more than 16 pairs of data (24 to 32 characters).

**-hexsecret**

If initiator user account data is being added, including the `-hexsecret` parameter specifies that `-secret` is a hexadecimal value.

**-o**

Executes the command without prompting for confirmation. If you include the `-o` switch, you will not be prompted to confirm that you want to add the user account data. If you do not use the `-o` switch, you will be prompted to confirm that you want to add the user.

**Example**

The following example adds a user account to the storage system database:

```
naviseccli connection -adduser -definedfor initiator -initiatorName 5.com.microsoft:cpc7745 -username Guest -secret 1234567890123456
```

Adding an iSCSI user account with the following attributes:

- Initiator Name: iqn.1991-05.com.microsoft:cpc7745
- User name: Guest
- Secret: 1234567890123456
- Defined For: initiator

Do you really want to perform this action (y/n)? y

To use this command with `navicli.jar`, replace `naviseccli` with `java -jar navicli.jar`.

**Output**

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

Delete a CHAP authentication user

**Description**
The `naviseccli` or `navicli.jar` `connection` command with the `-deleteuser` function deletes a specified initiator or target CHAP authentication user from the storage system CHAP user database.

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

**Format**
`connection -deleteuser` is used with `naviseccli` (described on page 2-6) or `navicli.jar` (described on page 2-31) as follows.

```bash
connection -deleteuser -definedFor initiator | target -initiatorName initiatorName -userName username [-o]
```

where

- **-definedFor initiator | target**
  - `initiator` specifies that an initiator user account will be deleted from the storage system user database. If you specify `initiator`, you must specify an initiator using the `-initiatorName` parameter.
  - `target` specifies that the target (storage system) user data will be deleted.

- **-initiatorName initiatorName**
  - If `initiator` user account data is being deleted, `initiatorName` is the name that was assigned for the initiator when the user account was created. The default initiator name is the IQN of the initiator.

- **-userName username**
  - Specifies the iSCSI CHAP username for the initiator or target user being deleted.

- **-o**
  - Executes the command without prompting for confirmation. If you include the `-o` switch, you will not be prompted to confirm the user account deletion. If you do not use the `-o` switch, you will be prompted to confirm that you want to delete the user account data.
**Example**  The following example deletes a user account from the storage
```
naviseccli connection -deleteuser -definedfor initiator
-initiatorName iqn.1991-05.com.microsoft:cpc7745 -username Guest
```

Deleting an iSCSI user account with the following attributes:
Initiator Name: iqn.1991-05.com.microsoft:cpc7745
User name: Guest
Defined For: initiator
Do you really want to perform this action (y/n)? y

To use this command with navicli.jar, replace naviseccli with java -jar navicli.jar.

**Output**  None if the command succeeds; status or error information if it fails.
connection -getuser

Display CHAP authentication user data

Description
The naviseccli or navicli.jar connection command with the -getuser function displays CHAP authentication user account data that is configured on the storage system. If no arguments are specified, all of the CHAP users defined on the storage system are displayed. Use -definedFor, -initiatorName, and -userName to display information for a specified user. If you specify a particular user and that user is not found, the error message, The specified user account does not exist, is returned.

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

Format
connection -getuser is used with naviseccli (described on page 2-6) or navicli.jar (described on page 2-31) as follows.

connection -getuser [-definedFor initiator | target] [-userName userName] [-initiatorName initiatorName]

where

-definedFor initiator | target

- initiator specifies that information for a CHAP initiator user is displayed. If you specify initiator, you must include the -userName and -initiatorName.

- target specifies that information for a CHAP target user (the storage system user account) is displayed. If you specify target, you must include the -userName.

-initiatorName initiatorName

The initiator is the host or HBA that initiates the connection with the target storage system. The initiator is identified by the IQN of the iSCSI initiator.

(userName

Specifies the iSCSI CHAP username for the initiator or target user being specified by initiatorName.
**Example**

The following example gets information on the current user:

```bash
naviseccli connection -getuser
```

To use this command with `navicli.jar`, replace `naviseccli` with `java -jar navicli.jar`.

**Output**

Initiator Name: iqn.1991-05.com.microsoft:cpc7745
User Name: Guest
Defined For: initiator
connection -getport

Retrieve a specific iSCSI port or the list of all the iSCSI ports

Description
The naviseccli or navicli.jar connection command with the -getport function displays information about either a specified iSCSI port or a list of all iSCSI ports. If no arguments are specified, all of the iSCSI ports defined on the targeted storage system are displayed.

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

Format
connection -getport is used with naviseccli (described on page 2-6) or navicli.jar (described on page 2-31) as follows.


where
The -sp and -portid parameters select which iSCSI ports will be displayed. If both options are specified, a particular iSCSI port is specified. If either or both of the options is omitted, all iSCSI ports that meet the search criteria are displayed.

-sp a | b
Specifies storage processor A or B. Information will be displayed only for iSCSI ports configured on the specified SP.

-portid portid
Specifies a iSCSI port ID. Displays information for only the specified iSCSI port.

The following parameters, -address, -subnetmask, -gateway, and -initiatorAuthentication define additional information that is displayed for iSCSI ports. If none of these options is specified, all fields are displayed. The SP and Port ID fields are always displayed.

-address
Displays the IP address of the specified iSCSI ports. The address is a 32-bit numeric address written as four 8-bit numbers (0-255) separated by periods (called the dotted-quad format). For example, 165.152.36.35.
-subnetmask
Displays the network mask for the specified iSCSI ports. The subnet mask uses the dotted-quad format. For example, 255.255.255.0.

-gateway
Displays the network gateway address that the specified iSCSI ports use. The gateway address uses the dotted-quad format. For example, 165.152.35.22.

-initiatorAuthentication
Displays the state of the initiator authentication flag for the specified iSCSI ports. True indicates that initiator authentication is turned on for the port and that all initiators logging into that port will be required to authenticate against the target storage system. False indicates that initiator authentication has been disabled for the port.

Examples
connection -getport displays information about all iSCSI ports configured on the storage system, or nothing if no iSCSI ports are configured.

connection -getport -sp a -portid 0 displays information about port 0 on SP A, or prints an error message if the iSCSI port does not exist.

connection -getport -sp a displays information about all iSCSI ports on SP A, or nothing if no iSCSI ports are configured on that SP.

connection -getport -portid 0 displays information about all iSCSI ports with ID 0, regardless of what SP they are configured on, or nothing if no matching ports are found.

The following example displays port information for the port with IP address 10.14.80.106:

naviseccli connection -getport

To use this command with navicli.jar, replace naviseccli with java -jar navicli.jar.

Output
SP: A
Port ID: 1
Port WWN: iqn.1992-04.com.emc:cx.apm00034901792.a1
IP Address: 10.14.80.109
Subnet Mask: 255.255.255.0

connection -getport
### iSCSI (Internet SCSI) Commands

<table>
<thead>
<tr>
<th>Gateway Address: 10.14.80.1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Initiator Authentication: false</td>
</tr>
<tr>
<td>SP: B</td>
</tr>
<tr>
<td>Port ID: 0</td>
</tr>
<tr>
<td>Port WWN: iqn.1992-04.com.emc:cx.apm00034901792.b0</td>
</tr>
<tr>
<td>IP Address: 10.14.80.110</td>
</tr>
<tr>
<td>Subnet Mask: 255.255.255.0</td>
</tr>
<tr>
<td>Gateway Address: 10.14.80.1</td>
</tr>
<tr>
<td>Initiator Authentication: false</td>
</tr>
</tbody>
</table>

| SP: B |
| Port ID: 1 |
| Port WWN: iqn.1992-04.com.emc:cx.apm00034901792.b1 |
| IP Address: 10.14.80.111 |
| Subnet Mask: 255.255.255.0 |
| Gateway Address: 10.14.80.1 |
| Initiator Authentication: false |

| SP: A |
| Port ID: 0 |
| Port WWN: iqn.1992-04.com.emc:cx.apm00034901792.a0 |
| IP Address: 10.14.80.108 |
| Subnet Mask: 255.255.255.0 |
| Gateway Address: 10.14.80.1 |
| Initiator Authentication: false |
connection -setPort

Modify the properties of a port

Description
The naviseccli or navicli.jar connection command with the -setPort function modifies the properties of a specified SP port.

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

Format
connection -setport is used with naviseccli (described on page 2-6) or navicli.jar (described on page 2-31) as follows.

connection -setport -sp a | b -portid portid -address address -subnetmask subnetmask -gateway gateway [-initiatorAuthentication 0 | 1] [-o]

where

-sp a | b
Specifies that the iSCSI port is on either SP A or SP B.

-portid portid
Specifies the port on the SP. For example, an SP with one port has port 1; an SP with two ports has port 0 and port 1.

-address address
Specifies the IP address of the iSCSI port. The address uses the dotted-quad format. For example, 165.152.36.35.

-subnetmask subnetmask
Specifies the subnetwork mask for the iSCSI port. The subnet mask uses the dotted-quad format. For example, 255.255.255.0.

-gateway gateway
Specifies the network gateway address that the iSCSI port uses. The gateway address uses the dotted-quad format. For example, 165.152.35.22.

-initiatorAuthentication 0 | 1
If initiator authentication is turned on, all initiators logging into the port must be authenticated by the storage system.

0 = Not required - default
1 = Required
-o

Executes the command without prompting for confirmation. If you include the -o switch, the port will be set (configured) without a confirmation prompt. Without the -o switch, the software displays confirmation messages that you must respond to.

Example

The following example configures the network settings for the port with IP address 10.14.80.110:

```
naviseccli connection -setport -sp b -portid 0 -address 10.14.80.110 -subnetmask 255.255.255.0 -gateway 10.14.80.1
```

Do you really want to perform this action (y/n)? y

To use this command with navicli.jar, replace naviseccli with java -jar navicli.jar

Output

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

Verify that packets reach a destination node without errors

Description
The naviseccli or navicli.jar connection command with the -pingnode function transmits packets to a target node and returns a notification that the packets have reached the node without errors. The connection -pingnode command pings a target node from the iSCSI port. Use the connection -pingnode and the connection -traceroute commands to verify and diagnose network connectivity.

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

Format
connection -pingnode is used with naviseccli (described on page 2-6) or navicli.jar (described on page 2-31) as follows.

connection -pingnode -sp a | b -portid portid -address address [-packetSize packetSize] [-count count] [-timeouts timeouts][-delays delays]

-sp A | B
  Specifies either storage processor A or storage processor B.

-portid portid
  Specifies the port on the SP, either 0 or 1. For example, an SP with one port has port 0; an SP with two ports has port 0 and port 1.

-address address
  Specifies the IP address of the target node that the iSCSI port will ping. The address is a 32-bit numeric address written as four numbers separated by periods, for example, 128.221.56.52. Network names are not supported.

-packetSize packetSize
  Specifies the size of the packets in bytes. The default is 32 bytes, the minimum is 0 bytes, and the maximum is 2048 bytes.

-count count
  Specifies the number of pings to send. The default is 4; the minimum is 1.
**-timeouts timeouts**

Specifies the response wait timeout period in seconds. The default is 3 seconds, the minimum is 1 second, and the maximum is 15 seconds.

**-delays delays**

Specifies a delay in seconds between pings. The default is 1 second, the minimum is 1 second, and the maximum is 10 seconds.

**Example**

The following example transmits packets to a target node, 128.221.92.225:

```
naviseccli connection -pingnode -sp a -portid 1 -address 128.221.92.225
```

To use this command with navicli.jar, replace naviseccli with java -jar navicli.jar.

**Output**

```
Reply from 128.221.92.225:  bytes=32 time=16ms TTL=30
Reply from 128.221.92.225:  bytes=32 time=1ms TTL=30
Reply from 128.221.92.225:  bytes=32 time=1ms TTL=30
Reply from 128.221.92.225:  bytes=32 time=1ms TTL=30
```
connection -traceroute

Display the route that a packet takes to a destination node

Description
The naviseccli or navicli.jar connection command with the -traceroute function displays the route that packets take to a target node that you specify in the command. The connection -traceroute command traces and displays the route from the storage system iSCSI port to the target node. Use the connection -traceroute and connection -pingnode commands to verify and diagnose network connectivity.

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

Format
connection -traceroute is used with naviseccli (described on page 2-6) or navicli.jar (described on page 2-31) as follows.

connection -traceroute -sp a | b -portid portid -address address [-packetSize packetSize] [-timeouts timeouts] [-delays delays]

where

-sp A | B

Specifies either storage processor A or storage processor B.

-portid portid

Specifies the port on the SP, either 0 or 1. For example, an SP with one port has port 0; an SP with two ports has port 0 and port 1.

-address address

Specifies the IP address of the target node that the iSCSI port will attempt to contact. The address uses the dotted-quad format, for example, 128.221.56.52. Network names are not supported.

-packetSize packetSize

Specifies the size of the echo packets in bytes. The default is 32 bytes, the minimum is 0 bytes, and the maximum is 2048 bytes.

-timeouts timeouts

Specifies the response wait timeout period in seconds. The default is 3 seconds, the minimum is 1 second, and the maximum is 15 seconds.
-delays delays

Specifies a delay in seconds between datagrams. The default is 1 second, the minimum is 1 second, and the maximum is 10 seconds.

Example

The following example displays the route taken by a packet:

```
naviseccli connection -traceroute -sp a -portid 1 -address 128.221.92.225
```

To use this command with navicli.jar, replace naviseccli with java -jar navicli.jar.

Output

```
1: 10.14.80.1   1 ms
2: 128.221.64.129 1 ms
3: 128.221.64.230 1 ms
4: 128.221.92.225 1 ms
```
isns -addserver

Adds an iSNS server to a storage system’s iSNS service configuration

Description

The `naviseccli` or `navicli.jar` `isns` command with the `-addserver` function, adds an iSNS server to a storage system’s iSNS service configuration.

When you add a server, if it is the first server you add to a storage system’s iSNS service configuration, it is designated as the primary server. If a server exists in the storage system’s iSNS service configuration, any subsequent server you add is designated as a backup.

The primary server is the server the iSNS service actively communicates with.

User Access

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

Format

`isns -addserver` is used with `naviseccli` (described on page 2-6) or `navicli.jar` (described on page 2-31) as follows.

`isns -addserver IPAddr [-o]`

where

`IPAddr`

The IP address of the iSNS server you want to add.

You must identify the iSNS server by the server’s IP address. Specify the IP address in the form b.c.d.e where b, c, d and e range from 0 through 255. Example: `111.222.33.44`.

`-o`

Executes the command without prompting for confirmation.

Conventions and Recommendations

None.
Example

The following example adds the specified iSNS server, to the storage system’s iSNS service configuration.

```
naviseccli -address ss1_spa isns -addserver 111.222.33.44
```

Adding an iSNS server with the following IP address: 111.222.33.44.

Do you really want to perform this action (y/n)? y

To use this command with navicli.jar, replace naviseccli with java -jar navicli.jar.

Output

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

Deletes an iSNS server from a storage system’s iSNS service configuration

**Description**
The naviseccli or navicli.jar isns command with the -deleteserver function, deletes an iSNS server from a storage system’s iSNS service configuration.

If the IP address of the server you specify to delete is not configured, you will receive an error message.

If you delete a primary server, the next server listed in the storage system’s iSNS service configuration becomes the primary.

The primary server is the server the iSNS service actively communicates with.

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

**Format**
isns -deleteserver is used with naviseccli (described on page 2-6) or navicli.jar (described on page 2-31) as follows.

```
isns -deleteserver IPAddr [-o]
```

where

**IPAddr**
The IP address of the iSNS server you want to delete.

You must identify the iSNS server by the server’s IP address. Specify the IP address in the form b.c.d.e where b, c, d and e range from 0 through 255. Example 111.222.33.44.

**-o**
Executes the command without prompting for confirmation.

**Conventions and Recommendations**
None.
iSCSI (Internet SCSI) Commands

Example
The following example deletes the specified iSNS server from the storage system's iSNS configuration.

```
naviseccli -address ss1_spa isns -deleteserver 111.222.33.44
```
Deleting an iSNS server with the following IP address: 111.222.33.44.

Do you really want to perform this action (y/n)? y

To use this command with navicli.jar, replace naviseccli with java -jar navicli.jar.

Output
None if the command succeeds; status or error information if it fails.
isns -listserver

Displays all iSNS servers that are configured in the storage system’s iSNS service

Description
The naviseccli or navicli.jar isns command with the -listserver function, lists all servers that are configured in a storage system’s iSNS service.

If there are multiple servers configured in the storage system’s iSNS service, the -listserver operation will list multiple IP addresses and server types. You can only have one primary server, therefore you will only have one server designated as the primary. All other servers are designated as backup servers.

The primary server is the server the iSNS service actively communicates with.

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

Format
isns -listserver is used with naviseccli (described on page 2-6) or navicli.jar (described on page 2-31) as follows.

naviseccli

Conventions and Recommendations
None.

Example
The following example lists the primary and backup iSNS servers for the storage system.

naviseccli -address ss1_spa isns -listserver

To use this command with navicli.jar, replace naviseccli with java -jar navicli.jar.
**Output**

IP Address: 111.222.33.44  
Server Type: Backup

IP Address: 111.222.33.45  
Server Type: Primary

IP Address is the IP address of the iSNS server. Server type specifies whether the server is set as the primary or backup server.
Sets a configured iSNS server, as the primary server for a storage system's iSNS service configuration

**Description**

The `naviseccli` or `navicli.jar isns` command with the `-setprimary` function, establishes a configured iSNS server as the primary server in a storage system’s iSNS service configuration. The primary server is the server the iSNS service actively communicates with. You can only have one primary server.

If the IP address of the server you specify to be the primary server is not configured, you will receive an error message.

You use this command when you want to change the primary server in a storage system’s iSNS service configuration. You can also use this command to re-establish a primary server after a failover. When a failure occurs which takes the existing primary server out of service, the iSNS service automatically establishes a backup server as the new primary server. You can use the `isns -setprimary` command to restore the original primary server as the primary server.

If you have more than one backup server, the first backup server listed becomes the new primary server (see `isns -listserver`).

**User Access**

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

**Format**

`isns -setprimary` is used with `naviseccli` (described on page 2-6) or `navicli.jar` (described on page 2-31) as follows.

`isns -setprimary IPAddr [-o]`

where

`IPAddr`

The IP address of the iSNS server you want to designate as the primary server.

You must identify the iSNS server by the server’s IP address. Specify the IP address in the form b.c.d.e where b, c, d and e range from 0 through 255. Example 111.222.33.44.
### Conventions and Recommendations

**-o**

Executes the command without prompting for confirmation.

None.

### Example

The following example establishes the specified iSNS server as the primary server.

```
naviseccli -address ss1_spa isns -setprimary 111.222.33.44
```

The listed IP Address will become the Primary iSNS server: 111.222.33.44.

Do you really want to perform this action (y/n)? **y**

To use this command with `navicli.jar`, replace `naviseccli` with `java -jar navicli.jar`.

### Output

None if the command succeeds; status or error information if it fails.
This chapter explains the Navisphere Manager CLI commands that manage LUN migration. LUN migration lets you improve the performance of a LUN by migrating the data from the source LUN to a destination LUN that has more desirable performance characteristics.

Not supported on AX-Series storage systems.

Major sections in the chapter are

- migrate -start ................................................................. 8-2
- migrate -cancel ............................................................... 8-4
- migrate -modify ............................................................... 8-5
- migrate -list ................................................................. 8-6
**migrate -start**

Starts a LUN migration session

**Description**

The navisccli or navicli.jar migrate command with the -start switch starts a LUN migration session.

If the maximum number of migrations already exists on the subsystem, the new session is still created, but its state is **queued**.

If you are running a VMware ESX Server and you are using the migration feature to copy LUNs to larger LUNs only, you must configure the LUNs as raw device mapping (RDM) volumes, set to physical compatibility mode. After you complete the migration you must rescan the bus at the ESX Server level. You can also rescan at the virtual machine level (optional). You then must expand the filesystem at the virtual machine level. The ESX Server and the virtual machine will now recognize the completed migration.

If you will be copying LUNs to larger LUNs that are not already configured as raw device mapping volumes, use the VMware *vmkfstools* utility to reconfigure them. For information on using this utility, refer to the Managing Raw Device Mappings - Utilities section found at www.vmware.com/pdf/esx25_rawdevicemapping.pdf

**User Access**

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

**Format**

`migrate -start` is used with navisccli (described on page 2-6) or navicli.jar (described on page 2-31) as follows.

```
 m ofate -start -source LUN ID | WWN -dest LUN ID | WWN [-rate low | medium | high | asap | value]
```

where

- **-source LUN ID | WWN**
  
  Specifies the source LUN of the migration. You can specify the LUN ID or World Wide Name (WWN).

- **-dest LUN ID | WWN**
  
  Specifies the destination LUN of the migration. You can specify the LUN ID or World Wide Name.
**LUN Migration Commands**

- **rate low | medium | high | asap | value**
  
  Specifies the LUN migration rate. Valid rates are low or 0, medium or 1, high or 2, and asap or 3.

**Conventions and Recommendations**

The destination LUN must be the same size or larger than the source LUN.

**Example**

```
naviseccli migrate -start -source 6 -dest 7 -rate low
```

This command starts a LUN migration session where the source LUN’s ID is 6, the destination LUN’s ID is 7, and the LUN migration rate is low.

To use this command with `navicli.jar`, replace `naviseccli` with `java -jar navicli.jar`.

**Output**

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

Cancels a LUN migration session

**Description**
The `naviseccli` or `navicli.jar` `migrate` command with the `-cancel` switch cancels an in-process LUN migration. The destination LUN is deleted when the cancel occurs.

You can cancel only one migration at a time.

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

**Format**
`migrate -cancel` is used with `naviseccli` (described on page 2-6) or `navicli.jar` (described on page 2-31) as follows.

```bash
migrate -cancel -source LUN ID | WWN [-o]
```

where

- `source LUN ID | WWN`
  Specifies the source LUN for migration as the LUN ID or World Wide Name (WWN).
- `-o`
  Overrides; does not prompt for confirmation.

**Conventions and Recommendations**
None.

**Example**
`naviseccli migrate -cancel -source 6`

This command cancels a LUN migration session whose source LUN’s ID is 6.

To use this command with `navicli.jar`, replace `naviseccli` with `java -jar navicli.jar`.

**Output**
None if the command succeeds; status or error information if it fails.
migrate -modify

Modifies a LUN migration session

Description
The naviseccli or navicli.jar migrate command with the -modify switch modifies a LUN migration session according to the parameters you specify.

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

Format
migrate -modify is used with naviseccli (described on page 2-6) or navicli.jar (described on page 2-31) as follows.

migrate -modify -source LUN ID|WWN
[-rate low | medium | high | asap | value] [-o]

where

-soure LUN ID | WWN
Specifies the source LUN of the migration you want to modify. You can specify the LUN ID or World Wide Name (WWN).

-rate low | medium | high | asap | value
Specifies the LUN migration rate. Valid rates are low or 0, medium or 1, high or 2, and asap or 3.

-o
Overrides; does not prompt for confirmation.

Conventions and Recommendations
None.

Example
naviseccli migrate -modify -source 6 -rate medium

This command modifies LUN migration rate to medium.

To use this command with navicli.jar, replace naviseccli with java -jar navicli.jar.

Output
None if the command succeeds; status or error information if it fails.
migrate -list

Lists LUN migration sessions and their properties

**Description**
The `naviseccli` or `navicli.jar migrate` command with the `-list` switch lists the existing LUN migration sessions and their properties.

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

**Format**
`migrate -list` is used with `naviseccli` (described on page 2-6) or `navicli.jar` (described on page 2-31) as follows.

```
```

where

- **-source LUN ID | WWN**
  Specifies the source LUN of the migration. You can specify the LUN ID or World Wide Name (WWN). If you specify the `-source` switch with a LUN, the command lists properties for only that migration. If you do not specify a source LUN, the output lists the properties for all migrations.

- **-destination**
  Displays the destination LUN.

- **-rate**
  Displays the LUN migration rate as **low, medium, high**, or **asap**.

- **-state**
  Displays the migration state as queued, migrating, migrated, transitioning, or faulted.

- **-percentcomplete**
  Displays the percentage of the migration that has completed.

- **-timeremaining**
  Displays the estimated time remaining for the migration to complete. For the first poll cycle after the migration is started, the Time Remaining field is displayed as ? (question mark).
Conventions and Recommendations

Example

naviseccli migrate -list

This command lists the migration sessions and their properties.

To use this command with navicli.jar, replace naviseccli with java -jar navicli.jar.

Output

Source LU Name: LUN 6
Source LU ID: 6
Dest LU Name: LUN 7
Dest LU ID: 7
Migration Rate: LOW
Current State: MIGRATING
Percent Complete: 12
Time Remaining: 1 minute(s)
This chapter provides a brief overview of the Navisphere Domain and Security features, and includes a list of commands you can use to manage storage system domains and user access to storage systems. For a detailed account of the Navisphere Domain and Security features, refer to the *EMC Navisphere Security Administrator’s Guide*.

Major sections are

- About Domains and User Accounts ................................. 9-2
- Domain and Security Commands Overview........................... 9-4
- domain -add ........................................................................ 9-5
- domain -list ........................................................................ 9-7
- domain -remove .............................................................. 9-9
- domain -setmaster .......................................................... 9-11
- security -adduser ............................................................ 9-13
- security -changeuserinfo .................................................. 9-15
- security -list ................................................................. 9-17
- security -rmuser ............................................................ 9-18
About Domains and User Accounts

A domain is a group of one or more storage systems with Storage Management Server software whose SPs are connected to a network and which have been assigned to the domain by Navisphere CLI or Navisphere Manager. Each domain has a master node (master storage system) that maintains the master copy of the domain data — the storage systems and global user accounts that make up the domain.

When you set up a user account, you assign a scope of either global or local. Global user accounts apply to all storage systems within a domain, while local user accounts apply to a specific storage system.

Setting up a domain allows a group of storage systems to be monitored and managed using a single login. Even if you plan to use a storage system by itself (manage it separately), we suggest that you create a domain for that system.

In order to issue Domain CLI commands, you must have global administrator privileges.

A user (that is, someone who needs to view or manage storage system operation) can have one of three roles:

- Administrator
- Manager
- Monitor

To issue Security CLI commands for user account set-up, modification, or removal you must have administrator privileges. Global administrators can manage both global and local user accounts. Local administrators can only manage local user accounts. See Table 9-1, Operations That Users With Different Roles Can Perform for an explanation of operations that can be performed by role and scope.

You can assign a user a role globally (the user has the role across all storage systems in the domain) or locally (the user has the role on a specific storage system only). Each global username must be unique in the domain; each local username must be unique within the local management server.
Usernames and passwords can be 1 to 32 characters, including letters (case sensitive), numbers, underscores, non-numeric, non-alpha characters, spaces, and must start with a letter.

The following table defines the operations a user can perform by role and scope.

Table 9-1  Operations That Users With Different Roles Can Perform

<table>
<thead>
<tr>
<th>User Role</th>
<th>Can View</th>
<th>Can Add, Modify, or Delete</th>
</tr>
</thead>
<tbody>
<tr>
<td>Global administrator</td>
<td>All domain and storage-system settings, and global and local accounts</td>
<td>All domain and storage-system settings, and global and local accounts (cannot delete the last global administrator account)</td>
</tr>
</tbody>
</table>
Domain and Security Commands Overview

The `naviseccli` or `navicli.jar` commands in this chapter include the Domain and Security commands. The following table identifies the commands.

<table>
<thead>
<tr>
<th>Table 9-2 naviseccli or navicli.jar Domain and Security Commands</th>
</tr>
</thead>
<tbody>
<tr>
<td>Command</td>
</tr>
<tr>
<td>---------</td>
</tr>
<tr>
<td><strong>Domain Commands</strong></td>
</tr>
<tr>
<td>domain -add</td>
</tr>
<tr>
<td>domain -list</td>
</tr>
<tr>
<td>domain -remove</td>
</tr>
<tr>
<td>domain -setmaster</td>
</tr>
<tr>
<td><strong>Security Commands</strong></td>
</tr>
<tr>
<td>security -adduser</td>
</tr>
<tr>
<td>security -changeuserinfo</td>
</tr>
<tr>
<td>security -list</td>
</tr>
<tr>
<td>security -rmuser</td>
</tr>
</tbody>
</table>
domain -add

Description
The naviseccli or navicli.jar domain command with the -add function, adds the storage system you specify to the storage system domain. You can choose to add one or multiple storage systems to the domain. When you add a storage system to the domain, you specify the storage system’s IP address.

See domain -setmaster if you need to establish a domain. You then can add storage systems to the domain using domain -add.

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

Format
domain -add is used with naviseccli (described on page 2-6) or navicli.jar (described on page 2-31) as follows.

domain -add IPAddr [-o]

where
IPAddr
The IP address of the storage system you want to add.

You must identify the storage system by the storage system’s IP address. Specify the IP address in the form b.c.d.e where b, c, d and e range from 0 through 255. Example 111.222.33.44.

-o
Executes the command without prompting for confirmation.

Conventions and Recommendations
None.
Domain and Security Commands

Example
The following example adds the specified storage systems, to the
storage system domain.

```bash
naviseccli -address ss1_spa domain -add 111.222.33.44 111.222.33.45
```

WARNING: You are about to add following node(s) to the
domain.
111.222.33.44
111.222.33.45

Proceed? (y/n) y

To use this command with navicli.jar, replace naviseccli with java -jar navicli.jar.

Output
None if the command succeeds; status or error information if it fails.
domain -list

Displays all storage systems in a domain

Description
The navisecli or navicli.jar domain command with the -list function, lists the IP address, name, port and secure port information for all storage systems in a storage system domain. If you only want to view information about the master storage system in the domain, you can use the optional -master switch.

You can only have one master storage system in a domain (see domain -setmaster).

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

Format
domain -list is used with navisecli (described on page 2-6) or navicli.jar (described on page 2-31) as follows.

domain -list [-master]

where

-master

Specifies to display only information about the master storage system in the domain.

Conventions and Recommendations
None.

Example
The following example lists the storage systems in the storage system domain.

navisecli -address 111.222.33.44 domain -list

To use this command with navicli.jar, replace navisecli with java -jar navicli.jar.
**Domain and Security Commands**

**Output**

<table>
<thead>
<tr>
<th>Node:</th>
<th>APM00011111111</th>
</tr>
</thead>
<tbody>
<tr>
<td>IP Address:</td>
<td>111.222.33.55 (Master)</td>
</tr>
<tr>
<td>Name:</td>
<td>CX300I_33_55</td>
</tr>
<tr>
<td>Port:</td>
<td>80</td>
</tr>
<tr>
<td>Secure Port:</td>
<td>443</td>
</tr>
<tr>
<td>IP Address:</td>
<td>111.222.33.44</td>
</tr>
<tr>
<td>Name:</td>
<td>CX300I_33_44</td>
</tr>
<tr>
<td>Port:</td>
<td>80</td>
</tr>
<tr>
<td>Secure Port:</td>
<td>443</td>
</tr>
</tbody>
</table>
domain -remove

Removes a storage system from a domain

**Description**
The `naviseccli` or `navicli.jar domain` command with the `-remove` function, removes the storage system you specify from a storage system domain. When you remove a storage system from a domain, you specify the storage system’s IP address.

If you want to move a storage system to a different domain, use `domain -remove` to remove the system from the current domain, then `domain -add` to add the system to the other domain.

**Important** If you remove the master storage system from the domain, you destroy the domain. The CLI warns you before you can complete the operation. If the storage system you want to move is the master storage system in the domain, and you want to retain the domain, then you should change the master storage system to another system in the domain before moving the old master (see domain -setmaster).

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

**Format**
`domain -remove` is used with `naviseccli` (described on page 2-6) or `navicli.jar` (described on page 2-31) as follows.

`domain -remove IPAddr [-o]`

where

`IPAddr`

The IP address of the storage system you want to remove.

You must identify the storage system by the storage system’s IP address. Specify the IP address in the form b.c.d.e where b, c, d and e range from 0 through 255. Example 111.222.33.44.

`-o`

Executes the command without prompting for confirmation.

**Conventions and Recommendations**
None.
**Domain and Security Commands**

**Example**  
The following example removes the specified storage system, from the storage system domain.

```
naviseccli -address ss1_spa domain -remove 111.222.33.44
```

WARNING: You are about to remove the following node from the domain: 111.222.33.44

Proceed? (y/n) y

To use this command with navicli.jar, replace naviseccli with java -jar navicli.jar.

**Output**  
None if the command succeeds; status or error information if it fails.
**domain -setmaster**

Sets a storage system as the master storage system in a domain

**Description**

The `navisecll` or `navicli.jar domain` command with the `-setmaster` function, establishes the storage system you specify as the master storage system in a domain. The master storage system holds the master copy of all global account information in the domain. This information is copied to all member storage systems in the domain. You can only have one master storage system in a domain. You can use `domain -setmaster` to establish a domain or to change the master storage system in an existing domain.

An AX-Series storage system can act as the domain master in a single-system domain that contains only an AX-Series system. An AX-Series system cannot act as domain master in a multiple-system domain. You must establish a CX-Series or off-array host to act as the domain master.

If you are using `domain -setmaster` to set up a domain, you specify the IP address of a new or existing storage system, not part of an existing domain. This storage system becomes the master and initializes the domain. You can then use the `domain -add` command to add additional storage systems to the domain.

When you use `domain -setmaster` to change the master storage system in an existing domain, the existing master storage system is automatically demoted, and the storage system you specify becomes the new master storage system.

**User Access**

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

**Format**

`domain -setmaster` is used with `navisecll` (described on page 2-6) or `navicli.jar` (described on page 2-31) as follows:

```
domain -setmaster IPAddr [-o]
```

where

`IPAddr`

The IP address of the storage system you want to set as master.
Domain and Security Commands

You must identify the storage system by the storage system’s IP address. Specify the IP address in the form b.c.d.e where b, c, d and e range from 0 through 255. Example 111.222.33.44.

-o

Executes the command without prompting for confirmation.

Conventions and Recommendations

None.

Example

The following example sets the specified storage system, as the master storage system in a domain.

`naviseccli -address ss1_spa domain -setmaster 111.222.33.44`

WARNING: You are about to set the following node as the master of the domain: 111.222.33.44

Proceed? (y/n) y

To use this command with navicli.jar, replace naviseccli with java -jar navicli.jar.

Output

None if the command succeeds; status or error information if it fails.
**security -adduser**

**Description**
The naviseclcli or navicli.jar security command with the -adduser function, adds a user account to the storage system you specify. If you create a global account, it replicates to all storage systems in the domain. When you add a user account, you specify the username, password, scope and role.

When you create the initial global administrator user account, you do not need to provide a username and password at login.

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

**Format**
security -adduser is used with naviseclcli (described on page 2-6) or navicli.jar (described on page 2-31) as follows.

```
security -adduser –user username –password password –scope global | local –role administrator | manager | monitor [-o]
```

where

- **–user username**
  Specifies the username you want to create for the user account.

- **–password password**
  Specifies the password you want to create for the user account.

- **–scope global | local**
  Specifies the scope, global or local, you want to apply to the user account.

- **–role administrator | manager | monitor**
  Specifies the role, administrator, manager, or monitor, you want to apply to the user account.

- **-o**
  Executes the command without prompting for confirmation.

**Conventions and Recommendations**
None.
Domain and Security Commands

Example

The following example creates the initial global administrator account on the storage system. You are then prompted to create a domain for the storage system you specify.

```
naviseccli -address ss1_spa security -adduser -user a -password b -scope global -role administrator
```

Global security is not initialized. It is highly recommended that you initialize global security.

Do you still want to continue? y

WARNING: You are about to add user:  a

Proceed?(y/n) y

This storage system is not in a domain. It is highly recommended you create a new domain for this system.

To use this command with navicli.jar, replace naviseccli with java -jar navicli.jar.

Output

None if the command succeeds; status or error information if it fails.
**Domain and Security Commands**

**security -changeuserinfo**

Changes the password and/or role of a user account.

**Description**

The `naviseccli` or `navicli.jar` security command with the `-changeuserinfo` function, modifies the password and/or role of a user account. When you modify a user account, you specify the username and scope, then designate a new password and/or role.

You can change the password in a user account without providing the user's current password.

**User Access**

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

**Format**

`security -changeuserinfo` is used with `naviseccli` (described on page 2-6) or `navicli.jar` (described on page 2-31) as follows.

```
security -changeuserinfo -user username -scope global|local [-newpassword password][-newrole administrator | manager | monitor] [-o]
```

where

- `-user username`
  
  Specifies the username of the user account you want to modify.

- `-scope global|local`
  
  Specifies the scope, global or local, of the user account you want to modify. A global account has access to all storage systems in a domain.

- `-newpassword password`
  
  Specifies the new password you want to create for the user account.

- `-newrole administrator | manager | monitor`
  
  Specifies the new role, administrator, manager, or monitor, you want to apply to the user account.

- `-o`
  
  Executes the command without prompting for confirmation.
Domain and Security Commands

Conventions and Recommendations

Example

The following example modifies the role of an existing user account.

```
naviseccli -address ss1_spa security -changeuserinfo -user b -scope local -newrole manager
```

WARNING: You are about to change user: b (local)

Proceed? (y/n) y

To use this command with navicli.jar, replace naviseccli with java -jar

navicli.jar

Output

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

Displays user accounts

Description
The naviseccli or navicli.jar security command with the -list function, lists the username, scope and role of user accounts. You can filter your selection using any combination of username, scope and role.

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

Format
security -list is used with naviseccli (described on page 2-6) or navicli.jar (described on page 2-31) as follows.

security -list [–user username] [–scope global | local] [–role administrator | manager | monitor]

where
–user username
    Identifies a specific username for which you want to display information.
–scope global | local
    Identifies users with a specific scope for which you want to display information.
–role administrator | manager | monitor
    Identifies users with a specific role for which you want to display information.

Conventions and Recommendations
None.

Example
The following example lists users with the specified scope and role.

naviseccli -address ss1_spa security -list –role monitor -scope global

to use this command with navicli.jar, replace naviseccli with java -jar navicli.jar.

Output
Username: c
Role: monitor
Scope: global
security -rmuser

Deletes a user account

Description

The naviseccli or navicli.jar security command with the -rmuser function, removes the user account you specify. When you remove a user account, you specify the username and scope.

You must specify a scope for the user you want to remove, since you can establish two user accounts with the same username and varying scopes, one global and one local.

User Access

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

Format

security -rmuser is used with naviseccli (described on page 2-6) or navicli.jar (described on page 2-31) as follows.

security -rmuser -user username -scope global|local [-o]

where

- user username
  Identifies the username of the account you want to remove.

- scope global|local
  Specifies the scope, global or local, of the account you want to remove.

- o
  Executes the command without prompting for confirmation.

Conventions and Recommendations

None.

Example

The following example removes the specified user account.

naviseccli -address ss1_spa security -rmuser -user b -scope local

WARNING: You are about to remove user: b (local)
Proceed? (y/n) y

To use this command with navicli.jar, replace naviseccli with java -jar navicli.jar.

Output

None if the command succeeds; status or error information if it fails.
This appendix lists the basic and Storage Group error codes that the CLI returns. It also includes SnapView and MirrorView error codes, although these applications are explained in other manuals. The numbers proceed sequentially.

Major topics are

- Basic Command Error Codes ..................................................... A-2
- Storage Group Command Error Codes ....................................... A-5
- SnapView, MirrorView, and Other CX-Series or FC4700-Series-Only Command Error Codes ......................... A-7
- Feature Command Error Codes .................................................. A-14
### Basic Command Error Codes

<table>
<thead>
<tr>
<th>Error Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>No error.</td>
</tr>
<tr>
<td>1</td>
<td>Invalid command line parameters.</td>
</tr>
<tr>
<td>2</td>
<td>Too few parameters.</td>
</tr>
<tr>
<td>3</td>
<td>Too many parameters.</td>
</tr>
<tr>
<td>4</td>
<td>Invalid bind type.</td>
</tr>
<tr>
<td>5</td>
<td>Invalid LUN number.</td>
</tr>
<tr>
<td>6</td>
<td>Invalid rebuild time.</td>
</tr>
<tr>
<td>7</td>
<td>Disk names for groups of RAID type 1/0 must have an even number of arguments.</td>
</tr>
<tr>
<td>8</td>
<td>Invalid number of disks in <code>bind</code> command.</td>
</tr>
<tr>
<td>9</td>
<td>Invalid disk name specified.</td>
</tr>
<tr>
<td>10</td>
<td>An enclosure containing one or more of the disks is not present.</td>
</tr>
<tr>
<td>11</td>
<td>Disk already bound or binding.</td>
</tr>
<tr>
<td>12</td>
<td>Disk is empty or missing.</td>
</tr>
<tr>
<td>13</td>
<td>Invalid stripe size.</td>
</tr>
<tr>
<td>14</td>
<td>Disk name not unique; all names in disk-name must be unique.</td>
</tr>
<tr>
<td>15</td>
<td>Invalid cache flags.</td>
</tr>
<tr>
<td>16</td>
<td>Invalid default owner.</td>
</tr>
<tr>
<td>17</td>
<td>Incorrect number of <code>chglun</code> parameters.</td>
</tr>
<tr>
<td>18</td>
<td>Unable to determine name of target host machine.</td>
</tr>
<tr>
<td>19</td>
<td>Enable/disable flag invalid.</td>
</tr>
<tr>
<td>20</td>
<td>Invalid usable cache size.</td>
</tr>
<tr>
<td>21</td>
<td>Invalid page size.</td>
</tr>
<tr>
<td>22</td>
<td>Invalid watermark value.</td>
</tr>
<tr>
<td>23</td>
<td>High watermark less than low watermark.</td>
</tr>
<tr>
<td>Error Value</td>
<td>Description</td>
</tr>
<tr>
<td>-------------</td>
<td>---------------------------------------------------------------</td>
</tr>
<tr>
<td>24</td>
<td>No device name listed on command line.</td>
</tr>
<tr>
<td>25</td>
<td>Invalid idle threshold.</td>
</tr>
<tr>
<td>26</td>
<td>Invalid idle delay.</td>
</tr>
<tr>
<td>27</td>
<td>Invalid write aside size.</td>
</tr>
<tr>
<td>28</td>
<td>Disks must be on separate buses for bind.</td>
</tr>
<tr>
<td>29</td>
<td>The Agent was unable to configure any devices.</td>
</tr>
<tr>
<td>30</td>
<td>LUN does not exist.</td>
</tr>
<tr>
<td>31</td>
<td>LUN already exists.</td>
</tr>
<tr>
<td>32</td>
<td>Cannot get current working directory for firmware command.</td>
</tr>
<tr>
<td>33</td>
<td>Illegal position for hot spare.</td>
</tr>
<tr>
<td>34</td>
<td>Invalid read cache value.</td>
</tr>
<tr>
<td>35</td>
<td>Invalid read cache size.</td>
</tr>
<tr>
<td>36</td>
<td>Invalid write cache value.</td>
</tr>
<tr>
<td>37</td>
<td>Invalid write cache size.</td>
</tr>
<tr>
<td>38</td>
<td>Invalid RAID 3 cache size.</td>
</tr>
<tr>
<td>39</td>
<td>Cannot access device.</td>
</tr>
<tr>
<td>40</td>
<td>Switch not supported.</td>
</tr>
<tr>
<td>41</td>
<td>Command is not supported.</td>
</tr>
<tr>
<td>42</td>
<td>Unknown error.</td>
</tr>
<tr>
<td>50</td>
<td>Agent - Memory allocation error.</td>
</tr>
<tr>
<td>51</td>
<td>Agent - Invalid device name.</td>
</tr>
<tr>
<td>52</td>
<td>Agent - Host connection not found.</td>
</tr>
<tr>
<td>53</td>
<td>Agent - SP not found.</td>
</tr>
<tr>
<td>54</td>
<td>Agent - Invalid SP suffix.</td>
</tr>
<tr>
<td>55</td>
<td>Agent - Invalid LUN number.</td>
</tr>
<tr>
<td>56</td>
<td>Agent - Invalid page size.</td>
</tr>
</tbody>
</table>
## CLI Error Codes

<table>
<thead>
<tr>
<th>Error Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>57</td>
<td>Agent - Invalid command line switch.</td>
</tr>
<tr>
<td>58</td>
<td>Agent - Error <code>bind</code> command.</td>
</tr>
<tr>
<td>59</td>
<td>Agent - Error <code>chglun</code> command.</td>
</tr>
<tr>
<td>60</td>
<td>Agent - Error <code>unbind</code> command.</td>
</tr>
<tr>
<td>61</td>
<td>Agent - Error <code>firmware</code> command.</td>
</tr>
<tr>
<td>62</td>
<td>Agent - Error <code>trespass</code> command.</td>
</tr>
<tr>
<td>63</td>
<td>Agent - Error <code>rebootSP</code> command.</td>
</tr>
<tr>
<td>64</td>
<td>Agent - Generic error.</td>
</tr>
<tr>
<td>65</td>
<td>Agent - Unknown error.</td>
</tr>
<tr>
<td>66</td>
<td>Error returned from Agent.</td>
</tr>
<tr>
<td>67</td>
<td>RAID 3 does not support write caching</td>
</tr>
<tr>
<td>68</td>
<td>RAID Group - Invalid RAID Group ID.</td>
</tr>
<tr>
<td>69</td>
<td>RAID Group - Valid values for trespass option are a and b.</td>
</tr>
<tr>
<td>70</td>
<td>RAID Group - Valid values for priority option are ASAP, High, Medium, and Low.</td>
</tr>
<tr>
<td>71</td>
<td>RAID Group - Valid values for lex option are yes and no.</td>
</tr>
<tr>
<td>72</td>
<td>RAID Group - RAID Group not found.</td>
</tr>
<tr>
<td>73</td>
<td>RAID Group - RAID Group not supported on this system.</td>
</tr>
<tr>
<td>74</td>
<td>RAID Group - Valid values for rm option are yes and no.</td>
</tr>
<tr>
<td>75</td>
<td>RAID Group - Valid values for sq option are mb, gb, sc, and bc.</td>
</tr>
<tr>
<td>76</td>
<td>RAID Group - Valid values for pl option are bf, ff.</td>
</tr>
<tr>
<td>77</td>
<td>RAID Group - Valid values for sp option are a and b.</td>
</tr>
<tr>
<td>78</td>
<td>RAID Group - Specific Disk download not supported.</td>
</tr>
<tr>
<td>79</td>
<td>RAID Group - This RAID Group has LUNs in it. Unbind them and run removerg again.</td>
</tr>
<tr>
<td>80</td>
<td>Zerodisk command failed.</td>
</tr>
<tr>
<td>81</td>
<td>Zeroing not supported.</td>
</tr>
</tbody>
</table>
### Storage Group Command Error Codes

<table>
<thead>
<tr>
<th>Error Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>82</td>
<td>This version of the FLARE software does not support Access Logix (SAN or shared storage) systems.</td>
</tr>
<tr>
<td>83</td>
<td>The group name entered does not match any Storage Groups for this storage system.</td>
</tr>
<tr>
<td>84</td>
<td>The HBA UID specified is not known by the storage system.</td>
</tr>
<tr>
<td>85</td>
<td>The LUN number specified is not a bound LUN number.</td>
</tr>
<tr>
<td>86</td>
<td>Fairness not supported.</td>
</tr>
<tr>
<td>87</td>
<td>The retyped password does not match (case sensitivity not checked).</td>
</tr>
<tr>
<td>88</td>
<td>Server could not be found, or is not running an Agent.</td>
</tr>
<tr>
<td>89</td>
<td>Invalid switch combination.</td>
</tr>
<tr>
<td>90</td>
<td>The UID (unique id) you entered does not match any Storage Groups for this storage system.</td>
</tr>
<tr>
<td>91</td>
<td>This version of FLARE software does not support the warm reboot feature.</td>
</tr>
<tr>
<td>92</td>
<td>Setpath cannot be used to map to the special default Storage Group.</td>
</tr>
<tr>
<td>93</td>
<td>Invalid number of disks in RAID Group.</td>
</tr>
<tr>
<td>94</td>
<td>This version of FLARE software does not support the Dual Simultaneous Access.</td>
</tr>
<tr>
<td>95</td>
<td>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 identifier(uid).</td>
</tr>
<tr>
<td>96</td>
<td>Inaccessible command.</td>
</tr>
<tr>
<td>97</td>
<td>New storage-system serial number must be a 12-character or less alphanumeric value.</td>
</tr>
<tr>
<td>98</td>
<td>Cannot perform inquiry.</td>
</tr>
<tr>
<td>99</td>
<td>Cannot read block data.</td>
</tr>
<tr>
<td>100</td>
<td>Cannot write to file.</td>
</tr>
<tr>
<td>101</td>
<td>Cannot open pipe.</td>
</tr>
</tbody>
</table>
### CLI Error Codes

<table>
<thead>
<tr>
<th>Error Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>102</td>
<td>The host specified is not known by the storage system.</td>
</tr>
<tr>
<td>103</td>
<td>Network name size is too big.</td>
</tr>
<tr>
<td>104</td>
<td>Network admin not configured.</td>
</tr>
<tr>
<td>105</td>
<td>Not a privileged user.</td>
</tr>
<tr>
<td>106</td>
<td>Read only access.</td>
</tr>
<tr>
<td>108</td>
<td>Invalid host description.</td>
</tr>
<tr>
<td>109</td>
<td>Invalid auto configuration.</td>
</tr>
<tr>
<td>110</td>
<td>Invalid privileged user list.</td>
</tr>
<tr>
<td>111</td>
<td>Invalid interval.</td>
</tr>
<tr>
<td>112</td>
<td>Invalid baud rate.</td>
</tr>
<tr>
<td>113</td>
<td>Invalid log size.</td>
</tr>
<tr>
<td>114</td>
<td>Invalid managed device.</td>
</tr>
<tr>
<td>115</td>
<td>Storage-system option not available.</td>
</tr>
<tr>
<td>116</td>
<td>Invalid megapoll value.</td>
</tr>
<tr>
<td>117</td>
<td>This version of Agent does not support Remote Agent Configuration.</td>
</tr>
<tr>
<td>118</td>
<td>Invalid use of explicit device names value.</td>
</tr>
<tr>
<td>119</td>
<td>The valid value of baud rate is 9600 or 19200.</td>
</tr>
<tr>
<td>120</td>
<td>This option is not supported.</td>
</tr>
<tr>
<td>121</td>
<td>Error while parsing file.</td>
</tr>
<tr>
<td>122</td>
<td>All of the specified users are already in the privileged user list.</td>
</tr>
</tbody>
</table>
SnapView, MirrorView, and Other CX-Series or FC4700-Series-Only Command Error Codes

For additional codes, see the CLI manual for your software.

<table>
<thead>
<tr>
<th>Error Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>123</td>
<td>Snapshot does not exist.</td>
</tr>
<tr>
<td>124</td>
<td>This version of FLARE software does not support SnapView.</td>
</tr>
<tr>
<td>125</td>
<td>Invalid SP name.</td>
</tr>
<tr>
<td>126</td>
<td>Reserved LUN pool does not exist.</td>
</tr>
<tr>
<td>127</td>
<td>Package number invalid.</td>
</tr>
<tr>
<td>128</td>
<td>This version of FLARE software does not support nondisruptive software installation (NDU).</td>
</tr>
<tr>
<td>129</td>
<td>Cannot open this file.</td>
</tr>
<tr>
<td>130</td>
<td>File does not exist.</td>
</tr>
<tr>
<td>131</td>
<td>RAID type must be r1 (RAID 1), r3 (RAID 3), r5 (RAID 5), or r1_0 (RAID1/0).</td>
</tr>
<tr>
<td>132</td>
<td>Multiple subcommands specified. Check syntax.</td>
</tr>
<tr>
<td>133</td>
<td>Disk for PSM must be on DPE bus 0.</td>
</tr>
<tr>
<td>134</td>
<td>Configuration does not exist.</td>
</tr>
<tr>
<td>135</td>
<td>Configuration already exists.</td>
</tr>
<tr>
<td>136</td>
<td>Size specified is too small.</td>
</tr>
<tr>
<td>137</td>
<td>Configuration does not exist. Run the navicli initializearray command to configure the system.</td>
</tr>
<tr>
<td>138</td>
<td>First option must be a subcommand.</td>
</tr>
<tr>
<td>139</td>
<td>Cannot create RAID Group for PSM (Persistent Storage Manager).</td>
</tr>
<tr>
<td>140</td>
<td>Name or UID (unique ID) is required.</td>
</tr>
<tr>
<td>141</td>
<td>Invalid name specified.</td>
</tr>
<tr>
<td>142</td>
<td>Image UID is required.</td>
</tr>
<tr>
<td>143</td>
<td>Name and LUN are required.</td>
</tr>
<tr>
<td>Error Value</td>
<td>Description</td>
</tr>
<tr>
<td>-------------</td>
<td>-------------</td>
</tr>
<tr>
<td>144</td>
<td>Storage-system UID (unique ID) and LUN UID are required.</td>
</tr>
<tr>
<td>145</td>
<td>Mirror not found.</td>
</tr>
<tr>
<td>146</td>
<td>Image not found.</td>
</tr>
<tr>
<td>147</td>
<td>Synchronized rate cannot be changed since input image is primary.</td>
</tr>
<tr>
<td>148</td>
<td>Name and UID both specified.</td>
</tr>
<tr>
<td>149</td>
<td>Invalid reserved LUN pool.</td>
</tr>
<tr>
<td>150</td>
<td>Invalid session.</td>
</tr>
<tr>
<td>151</td>
<td>Session does not exist.</td>
</tr>
<tr>
<td>152</td>
<td>Session is stopping.</td>
</tr>
<tr>
<td>153</td>
<td>Invalid snapshot.</td>
</tr>
<tr>
<td>154</td>
<td>Snapshot does not exist.</td>
</tr>
<tr>
<td>155</td>
<td>The <code>-o</code> option requires <code>&quot;-all&quot;</code> or <code>&quot;-filename.&quot;</code></td>
</tr>
<tr>
<td>156</td>
<td>Path to store files is required.</td>
</tr>
<tr>
<td>157</td>
<td>Cannot specify both <code>&quot;-all&quot;</code> and <code>&quot;-filename.&quot;</code></td>
</tr>
<tr>
<td>158</td>
<td>Enter file index or <code>&quot;quit.&quot;</code></td>
</tr>
<tr>
<td>159</td>
<td>Invalid input.</td>
</tr>
<tr>
<td>160</td>
<td>Index is out of range.</td>
</tr>
<tr>
<td>161</td>
<td>File not found.</td>
</tr>
<tr>
<td>162</td>
<td>Space not available to retrieve file.</td>
</tr>
<tr>
<td>163</td>
<td>Specified feature not supported.</td>
</tr>
<tr>
<td>164</td>
<td>Feature must be specified.</td>
</tr>
<tr>
<td>165</td>
<td>Cannot specify both <code>&quot;-lun&quot;</code> and <code>&quot;-lunuid&quot;</code>.</td>
</tr>
<tr>
<td>166</td>
<td>Invalid Storage Processor name.</td>
</tr>
<tr>
<td>167</td>
<td>PSM (Persistent Storage Manager) is not broken.</td>
</tr>
<tr>
<td>168</td>
<td>PSM (Persistent Storage Manager) is broken. Cannot list or create PSM.</td>
</tr>
<tr>
<td>169</td>
<td>LUN cannot be unbound.</td>
</tr>
<tr>
<td>Error Value</td>
<td>Description</td>
</tr>
<tr>
<td>-------------</td>
<td>--------------------------------------------------</td>
</tr>
<tr>
<td>170</td>
<td>Operation not supported on this type of storage system.</td>
</tr>
<tr>
<td>171</td>
<td>Incompatible arguments. Invalid storage-system serial number.</td>
</tr>
<tr>
<td>172</td>
<td>Directory not specified.</td>
</tr>
<tr>
<td>173</td>
<td>Invalid number of blocks.</td>
</tr>
<tr>
<td>174</td>
<td>Number of blocks not specified.</td>
</tr>
<tr>
<td>175</td>
<td>Reading of data not supported on this storage system.</td>
</tr>
<tr>
<td>176</td>
<td>Invalid snapshot World Wide Name (WWN).</td>
</tr>
<tr>
<td>177</td>
<td>Invalid storage-system serial number.</td>
</tr>
<tr>
<td>178</td>
<td>Navicli '-f' option required to store data in file.</td>
</tr>
<tr>
<td>179</td>
<td>Invalid IP address format.</td>
</tr>
<tr>
<td>180</td>
<td>Storage Group cannot be shared.</td>
</tr>
<tr>
<td>181</td>
<td>Invalid HLU number.</td>
</tr>
<tr>
<td>182</td>
<td>Invalid ALU number.</td>
</tr>
<tr>
<td>183</td>
<td>Invalid port ID.</td>
</tr>
<tr>
<td>184</td>
<td>Remote server cannot be managed.</td>
</tr>
<tr>
<td>185</td>
<td>Email response test failed.</td>
</tr>
<tr>
<td>186</td>
<td>Emailpage response test failed.</td>
</tr>
<tr>
<td>187</td>
<td>Modempage response test failed.</td>
</tr>
<tr>
<td>188</td>
<td>SNMP response test failed.</td>
</tr>
<tr>
<td>189</td>
<td>Phone home response test failed.</td>
</tr>
<tr>
<td>190</td>
<td>Mandatory switch for email/emailpage.</td>
</tr>
<tr>
<td>191</td>
<td>Mandatory switch for modempage.</td>
</tr>
<tr>
<td>192</td>
<td>Mandatory switch for SNMP.</td>
</tr>
<tr>
<td>193</td>
<td>Only one message or file can be specified.</td>
</tr>
<tr>
<td>194</td>
<td>Valid dial string contains only digits, parentheses, hyphen.</td>
</tr>
<tr>
<td>195</td>
<td>File does not exist or cannot open.</td>
</tr>
</tbody>
</table>
### CLI Error Codes

<table>
<thead>
<tr>
<th>Error Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>196</td>
<td>Specified user already exists.</td>
</tr>
<tr>
<td>197</td>
<td>The offset switch is not supported for this storage system.</td>
</tr>
<tr>
<td>198</td>
<td>Valid COM port number is 1,2,3,or 4.</td>
</tr>
<tr>
<td>199</td>
<td>Valid dial command is atd, atDp or atD.</td>
</tr>
<tr>
<td>200</td>
<td>Valid message delay contains only &quot;..&quot; (one or more commas).</td>
</tr>
<tr>
<td>202</td>
<td>Target LUN number is missing.</td>
</tr>
<tr>
<td>203</td>
<td>Session name is missing.</td>
</tr>
<tr>
<td>204</td>
<td>SnapView multiple session feature is not supported.</td>
</tr>
<tr>
<td>205</td>
<td>Cannot specify both snapshot name and snapshot ID.</td>
</tr>
<tr>
<td>206</td>
<td>Cannot specify both -mode and -simulation.</td>
</tr>
<tr>
<td>207</td>
<td>This command is not supported on remote host.</td>
</tr>
<tr>
<td>208</td>
<td>Switch -pathname must be specified.</td>
</tr>
<tr>
<td>209</td>
<td>Get local server attributes failed.</td>
</tr>
<tr>
<td>210</td>
<td>This version of FLARE software does not support Hi5 RAID type.</td>
</tr>
<tr>
<td>211</td>
<td>Only one of the switches -snapshotid, -snapshotname, or -lun can be specified.</td>
</tr>
<tr>
<td>212</td>
<td>Specified session and snapshot must be based on the same target LUN.</td>
</tr>
<tr>
<td>213</td>
<td>Cannot add LUN to reserved LUN pool; the maximum number of reserved LUNs has been allocated.</td>
</tr>
<tr>
<td>214</td>
<td>Cannot add LUN to reserved LUN pool; the maximum number of reserved LUNs that can be added is n.</td>
</tr>
<tr>
<td>215</td>
<td>The HLU (host LUN) number you specified cannot be found.</td>
</tr>
<tr>
<td>216</td>
<td>This command must be issued from the SP to which the LUN will trespass.</td>
</tr>
<tr>
<td>217</td>
<td>Invalid bus or enclosure number.</td>
</tr>
<tr>
<td>218</td>
<td>Invalid WWN seed.</td>
</tr>
<tr>
<td>219</td>
<td>Invalid EMC part number.</td>
</tr>
<tr>
<td>220</td>
<td>This RAID Group has maximum number of LUNs already.</td>
</tr>
<tr>
<td>Error Value</td>
<td>Description</td>
</tr>
<tr>
<td>-------------</td>
<td>-------------</td>
</tr>
<tr>
<td>221</td>
<td>Not enough reserved LUNs in the specified SP's reserved LUN pool.</td>
</tr>
<tr>
<td>222</td>
<td>This LUN cannot be added to the Storage Group since it is participating in a remote mirror.</td>
</tr>
<tr>
<td>223</td>
<td>Allocate log must specify LUN with valid owner.</td>
</tr>
<tr>
<td>224</td>
<td>This request has been issued through the SP that is not the current owner of the targeted LUN.</td>
</tr>
<tr>
<td>226</td>
<td>Invalid NDB password.</td>
</tr>
<tr>
<td>227</td>
<td>Insert test event failed.</td>
</tr>
<tr>
<td>228</td>
<td>The <code>-addroffset</code> switch is supported only for a non-destructive bind.</td>
</tr>
<tr>
<td>229</td>
<td>The <code>-addroffset</code> switch must be supplied for a non-destructive bind.</td>
</tr>
<tr>
<td>230</td>
<td>Cannot unbind LUN, PSM LUN that is not double faulted.</td>
</tr>
<tr>
<td>231</td>
<td>Cannot unbind LUN because it is in use as an active hot spare.</td>
</tr>
<tr>
<td>232</td>
<td>Cannot unbind LUN because a feature of the storage system is using it.</td>
</tr>
<tr>
<td>233</td>
<td>Cannot unbind LUN because it is contained within a Storage Group.</td>
</tr>
<tr>
<td>235</td>
<td>Cannot display LUN WWNs and update LUN map information at the same time.</td>
</tr>
<tr>
<td>277</td>
<td>Error: <code>-phonehome</code> response test is not supported on the targeted Agent. Please use <code>-ipconnecthome</code> or <code>-mdmconnecthome</code> instead.</td>
</tr>
<tr>
<td>278</td>
<td>Response using modem from Agent on SP is not supported.</td>
</tr>
<tr>
<td>279</td>
<td>Error: <code>-ipconnecthome</code> response test failed.</td>
</tr>
<tr>
<td>280</td>
<td>Error: <code>-ipconnecthome</code> is not supported.</td>
</tr>
<tr>
<td>281</td>
<td>Error: <code>-mdmconnecthome</code> response test failed.</td>
</tr>
<tr>
<td>282</td>
<td>Error: <code>-mdmconnecthome</code> is not supported.</td>
</tr>
<tr>
<td>283</td>
<td>Error: <code>-connecto</code> and <code>-routerip</code> are mandatory.</td>
</tr>
<tr>
<td>284</td>
<td>Error: <code>-modemnum</code>, <code>-connecto</code>, and <code>-method</code> are mandatory.</td>
</tr>
<tr>
<td>285</td>
<td>Error: <code>-smtpmailserver</code>, <code>-destaddress</code>, and <code>-serialnumber</code> are mandatory.</td>
</tr>
<tr>
<td>286</td>
<td>Error: <code>-emailhome</code> response test failed.</td>
</tr>
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### CLI Error Codes

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<thead>
<tr>
<th>Error Value</th>
<th>Description</th>
</tr>
</thead>
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<tr>
<td>288</td>
<td>Cannot add a hot spare to a Storage Group.</td>
</tr>
<tr>
<td>289</td>
<td>Chglun parameter not supported on a non-Flare LUN.</td>
</tr>
<tr>
<td>290</td>
<td>Unable to bind the metaLUN, use CLE command <code>metalun -destroy</code> instead.</td>
</tr>
<tr>
<td>291</td>
<td>This version of FLARE software does not support <code>getsniffer</code> or <code>setsniffer</code> on metaLUNs.</td>
</tr>
<tr>
<td>292</td>
<td>You must issue this command from the SP that owns the LUN on which the verify will be run.</td>
</tr>
<tr>
<td>293</td>
<td>Cannot specify both <code>-feature</code> and <code>-featurename</code>.</td>
</tr>
<tr>
<td>326</td>
<td>Invalid switch specified for a reserved snap session.</td>
</tr>
<tr>
<td>327</td>
<td>Invalid switch specified for a reserved snap LUN.</td>
</tr>
<tr>
<td>328</td>
<td>Cannot activate reserved snapshot LUN.</td>
</tr>
<tr>
<td>329</td>
<td>Cannot deactivate reserved snapshot LUN.</td>
</tr>
<tr>
<td>330</td>
<td>Cannot stop a reserved session.</td>
</tr>
<tr>
<td>331</td>
<td>Cannot remove a reserved snapshot LUN.</td>
</tr>
<tr>
<td>332</td>
<td>Cannot modify a reserved snapshot LUN.</td>
</tr>
<tr>
<td>333</td>
<td>Cannot start rollback on a reserved session.</td>
</tr>
<tr>
<td>334</td>
<td>Cannot change rollback session as it is reserved.</td>
</tr>
<tr>
<td>335</td>
<td>The format of decimal number specified is inappropriate.</td>
</tr>
<tr>
<td>336</td>
<td>Precision of the decimal number specified exceeds the maximum precision of n (where n varies depending upon the situation).</td>
</tr>
<tr>
<td>338</td>
<td>Cannot add a snapshot to Storage Group because the snapshot specified is reserved.</td>
</tr>
<tr>
<td>344</td>
<td>Use the <code>-nolocal</code> switch if Agent version is not at least version 6.5 when setting SPS time.</td>
</tr>
<tr>
<td>345</td>
<td>Do not use the <code>-nolocal</code> switch if Agent version is version 6.5 or greater when setting SPS time.</td>
</tr>
<tr>
<td>Error Value</td>
<td>Description</td>
</tr>
<tr>
<td>-------------</td>
<td>-------------</td>
</tr>
<tr>
<td>346</td>
<td>This storage system does not support any NVRAM card.</td>
</tr>
<tr>
<td>347</td>
<td>This storage system does not support any operation on shutting down the array.</td>
</tr>
<tr>
<td>348</td>
<td>This storage system does not support any operation on LUN cache dirty condition.</td>
</tr>
<tr>
<td>349</td>
<td>Error parsing .lst file.</td>
</tr>
<tr>
<td>350</td>
<td>Cannot open .lst file.</td>
</tr>
<tr>
<td>351</td>
<td>Syntax error in .lst file.</td>
</tr>
<tr>
<td>353</td>
<td>The LUN list contains duplicate LUN number.</td>
</tr>
</tbody>
</table>
**Feature Command Error Codes**

The following tables list decimal and hexadecimal values and descriptions of feature command errors, which includes mapped RAID errors, LUN migration errors, Connection and iSNS (iSCSI) errors, and Domain and Security errors.

---

### General Feature Command Errors

<table>
<thead>
<tr>
<th>Error Value (Decimal)</th>
<th>Error Value (Hexadecimal)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>19712</td>
<td>0x4D00</td>
<td>Management Server is not available.</td>
</tr>
<tr>
<td>19713</td>
<td>0x4D01</td>
<td>Error encountered during command execution.</td>
</tr>
<tr>
<td>19714</td>
<td>0x4D02</td>
<td>Invalid command entered.</td>
</tr>
<tr>
<td>19715</td>
<td>0x4D03</td>
<td>Command is running. Client should poll for status.</td>
</tr>
<tr>
<td>19920</td>
<td>0x4DD0</td>
<td>Invalid command.</td>
</tr>
</tbody>
</table>

### Mapped RAID Errors

<table>
<thead>
<tr>
<th>Error Value (Decimal)</th>
<th>Error Value (Hexadecimal)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>19840</td>
<td>0x4D80</td>
<td>Invalid MetaLUN command.</td>
</tr>
<tr>
<td>19841</td>
<td>0x4D81</td>
<td>MetaLUN feature object is not available.</td>
</tr>
<tr>
<td>19842</td>
<td>0x4D82</td>
<td>MetaLUN feature is not enabled.</td>
</tr>
<tr>
<td>19843</td>
<td>0x4D83</td>
<td>Unexpected error occurred during MetaLUN command execution.</td>
</tr>
<tr>
<td>19844</td>
<td>0x4D84</td>
<td>Specified MetaLUN is not available.</td>
</tr>
<tr>
<td>19845</td>
<td>0x4D85</td>
<td>Specified base LU is not available.</td>
</tr>
<tr>
<td>19846</td>
<td>0x4D86</td>
<td>Specified LU is not available.</td>
</tr>
<tr>
<td>19847</td>
<td>0x4D87</td>
<td>Destroy multiple ALUs failed.</td>
</tr>
<tr>
<td>19848</td>
<td>0x4D88</td>
<td>Destroy multiple ALUs was only partially successful.</td>
</tr>
</tbody>
</table>
### LUN Migration Errors

<table>
<thead>
<tr>
<th>Error Value (Decimal)</th>
<th>Error Value (Hexadecimal)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>21248</td>
<td>0x5300</td>
<td>Invalid LUN Migration command.</td>
</tr>
<tr>
<td>21249</td>
<td>0x5301</td>
<td>LUN Migration feature object is not available.</td>
</tr>
<tr>
<td>21250</td>
<td>0x5302</td>
<td>LUN Migration feature is not enabled.</td>
</tr>
<tr>
<td>21251</td>
<td>0x5303</td>
<td>Unexpected error occurred during LUN Migration command execution.</td>
</tr>
<tr>
<td>21252</td>
<td>0x5304</td>
<td>LUN Migration object not available.</td>
</tr>
<tr>
<td>21253</td>
<td>0x5305</td>
<td>LUN Migration source LU is not available.</td>
</tr>
<tr>
<td>21254</td>
<td>0x5306</td>
<td>LUN Migration base cannot be a hot spare.</td>
</tr>
<tr>
<td>21255</td>
<td>0x5307</td>
<td>LUN Migration destination LU is not available.</td>
</tr>
</tbody>
</table>

### Connection and iSNS (iSCSI) Errors

<table>
<thead>
<tr>
<th>Error Value (Decimal)</th>
<th>Error Value (Hexadecimal)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>21280</td>
<td>0x5320</td>
<td>Invalid connection command.</td>
</tr>
<tr>
<td>21281</td>
<td>0x5321</td>
<td>Connection feature object is not available.</td>
</tr>
<tr>
<td>21282</td>
<td>0x5322</td>
<td>Connection software is not enabled.</td>
</tr>
<tr>
<td>21283</td>
<td>0x5323</td>
<td>Unexpected error occurred during connection command execution.</td>
</tr>
<tr>
<td>21456</td>
<td>0x53D0</td>
<td>Invalid isns command.</td>
</tr>
<tr>
<td>21457</td>
<td>0x53D1</td>
<td>Isns feature object is not available.</td>
</tr>
<tr>
<td>21458</td>
<td>0x53D2</td>
<td>Isns enabling software is not installed.</td>
</tr>
<tr>
<td>21459</td>
<td>0x53D3</td>
<td>Unexpected error occurred during isns command execution.</td>
</tr>
</tbody>
</table>
## Domain and Security Errors

<table>
<thead>
<tr>
<th>Error Value (Decimal)</th>
<th>Error Value (Hexadecimal)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>21408</td>
<td>0x53A0</td>
<td>Invalid domain command.</td>
</tr>
<tr>
<td>21409</td>
<td>0x53A1</td>
<td>Domain feature object is not available.</td>
</tr>
<tr>
<td>21410</td>
<td>0x53A2</td>
<td>Unexpected error occurred during domain command execution.</td>
</tr>
<tr>
<td>21360</td>
<td>0x5370</td>
<td>Invalid security command.</td>
</tr>
<tr>
<td>21361</td>
<td>0x5371</td>
<td>Security feature object is not available.</td>
</tr>
<tr>
<td>21362</td>
<td>0x5372</td>
<td>Unexpected error occurred during security command execution.</td>
</tr>
</tbody>
</table>
This appendix provides a list of commands that are not supported by Secure CLI. Any command not listed in the following table that is issued to a Host Agent, is not supported by Secure CLI.
Unsupported Commands

In addition to the commands listed in the following table, the -d (device) switch is not supported in Secure CLI. The -d switch is used when issuing commands to Host Agents. In general, if your existing syntax requires the -d switch, you must use Classic CLI to issue the commands. See navicli on page 2-20 for more information on the -d switch.

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<th>Command</th>
<th>Issue Command Using</th>
</tr>
</thead>
<tbody>
<tr>
<td>accesscontrol</td>
<td>Classic CLI (navicli)</td>
</tr>
<tr>
<td>failback</td>
<td>Classic CLI (navicli)</td>
</tr>
<tr>
<td>fairness</td>
<td>Classic CLI (navicli)</td>
</tr>
<tr>
<td>getatf</td>
<td>Classic CLI (navicli)</td>
</tr>
<tr>
<td>initializearray</td>
<td>Classic CLI (navicli)</td>
</tr>
<tr>
<td>lunmapinfo</td>
<td>Classic CLI (navicli)</td>
</tr>
<tr>
<td>managefiles</td>
<td>Java CLI (navicli.jar)</td>
</tr>
<tr>
<td>ndu</td>
<td>Classic CLI (navicli)</td>
</tr>
<tr>
<td>r3wrbuff</td>
<td>Classic CLI (navicli)</td>
</tr>
<tr>
<td>readcru</td>
<td>Classic CLI (navicli)</td>
</tr>
<tr>
<td>readlun</td>
<td>Classic CLI (navicli)</td>
</tr>
<tr>
<td>register</td>
<td>Classic CLI (navicli)</td>
</tr>
<tr>
<td>setloop</td>
<td>Classic CLI (navicli)</td>
</tr>
<tr>
<td>setraid5</td>
<td>Classic CLI (navicli)</td>
</tr>
<tr>
<td>upload</td>
<td>Classic CLI (navicli)</td>
</tr>
</tbody>
</table>
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