



**EMC CLARiiON Server Support Products  
for Windows**

**INSTALLATION GUIDE**

**P/N 300-002-038**

**REV A05**

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Published February, 2006

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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 guide 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 guide, please contact your EMC representative.*

### **Audience**

This guide is part of the EMC<sup>®</sup> Navisphere<sup>®</sup> documentation set, and is intended for use by a system administrator during the installation of the Navisphere Storage System Initialization Utility, Navisphere Host Agent, Navisphere Server Utility, Navisphere Command Line Interface (CLI), admhost, or admsnap software on a Microsoft server running the Windows Server<sup>™</sup> 2003 or Windows<sup>®</sup> 2000 operating system.

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

- ◆ Microsoft server hardware
- ◆ Microsoft Windows operating system, especially with how the operating system handles logical disks or volumes.

**Organization**

This manual contains four chapters, as follows:

- Chapter 1 Describes the CLARiiON server-based applications and lists the requirements for these applications. This chapter also provides sample management configurations.
- Chapter 2 Describes how to install and use the Navisphere Storage System Initialization Utility.
- Chapter 3 Describes how to install and use the Navisphere Host Agent and the Navisphere Server Utility.
- Chapter 4 Describes how to install the Admhost Utility, Admsnap Utility, and the CLARiiON VSS Provider. This chapter also describes how to use admhost and refers you to the documentation that describes how to use admsnap and the VSS Provider.
- Chapter 5 Describes how to install and remove Navisphere CLI and refers you to the documentation that describes how to use Navisphere CLI.
- Appendix A Describes how to perform a silent installation and removal of the Initialization Utility, Host Agent, Server Utility, and Navisphere CLI.

**Related documentation**

Related documents include

- ◆ *Navisphere Host Agent/CLI and Utilities Release Notes*
- ◆ *Admhost Release Notes*
- ◆ *Admsnap Release Notes*
- ◆ *EMC Navisphere Manager Administrator's Guide* (P/N 069001125)
- ◆ *EMC Navisphere Command Line Interface (CLI) Reference* (P/N 069001038)
- ◆ *EMC SnapView Command Line Interfaces Reference* (P/N 069001181)

- ◆ *EMC SAN Copy Command Line Interfaces Reference*  
(P/N 069001189)
- ◆ *EMC MirrorView Command Line Interface (CLI) Reference*  
(P/N 069001184)

## Conventions used in this guide

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

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

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### **CAUTION**

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

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### **Typographical Conventions**

This manual uses the following format conventions:

<b>This typeface</b>	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.
<i>This typeface</i>	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.
x > y	Represents a menu path. For example, <b>Operations &gt; Poll All Storage Systems</b> tells you to select <b>Poll All Storage Systems</b> on the <b>Operations</b> menu.
[ ]	Encloses optional entries.
	Separates alternative parameter values; for example: <i>LUN-name   LUN-number</i> means you can use either the LUN-name or the LUN-number.

**Finding current information**

The most up-to-date information about the Host Agent, Navisphere Server Utility, CLI, admhost, or admsnap software, is posted on the EMC Powerlink™ website. We recommend that you download the latest information before you install the Host Agent, Navisphere Server Utility, CLI, admhost, or admsnap software. If you purchased this product from an EMC reseller and you cannot access Powerlink, the latest product information should be available from your reseller.

To access EMC Powerlink, use the following link:

<http://Powerlink.EMC.com>

After you log in, select **Support > Document Library** and find the following:

- ◆ *Navisphere Host Agent and CLI Release Notes*
- ◆ The latest version of this guide 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 attach 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 website 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](mailto:techpub_comments@EMC.com) with your opinions of this guide.



## About the CLARiiON Server Applications

This chapter describes the CLARiiON server-based applications. This chapter also provides sample management configurations.

All CLARiiON server-based applications are supported on both CX-Series and AX-Series storage systems that have been upgraded to Navisphere Manager; that is, that have the Navisphere Manager enabler installed. Only the Navisphere Storage System Initialization Utility and the Navisphere Server Utility are supported on AX-Series storage systems running Navisphere Express.

## About EMC Navisphere software

The following EMC® server-based software is available on the server support CD that shipped with your storage system or your upgrade kit (for AX-Series systems upgrading to Navisphere Manager):

- ◆ Navisphere® Storage System Initialization Utility
- ◆ Navisphere Host Agent
- ◆ Navisphere Server Utility
- ◆ Admhost Utility
- ◆ Admsnap Utility
- ◆ CLARiiON® VSS Provider (Windows Server 2003 only)
- ◆ Navisphere Command Line Interface (CLI)

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### 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.

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**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.

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## Navisphere Host Agent

The Host Agent registers the server's HBA (host bus adapter) with the attached CX-Series, AX-Series, or FC-Series storage system when the Agent service starts. This action sends the initiator records for each HBA to the storage system. Initiator records are used to control access to storage system data. For pre-FC4700 storage systems, the Agent will send the initiator records only if Access Logix™ software is installed.

The Agent can then retrieve information from the storage system automatically at startup or when requested by Manager or CLI.

The Host Agent can also

- ◆ Send drive mapping information to the attached CLARiiON® storage systems.
- ◆ Monitor storage-system events and can notify personnel by e-mail, page, or modem when any designated event occurs.
- ◆ Retrieve LUN WWN (world wide name) and capacity information from Symmetrix® storage systems.

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**Important** The Host Agent is supported for CX-Series, FC-Series, and AX-Series storage systems that have been upgraded to Navisphere Manager, that is, that have the Navisphere Manager Enabler installed.

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.

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## 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 on a Windows server 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.

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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.

- ◆ 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.

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**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.

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## Admhost Utility

The Admhost Utility is an executable program that you can run interactively via script. It runs only on Microsoft Windows Server™ 2003 or Windows® 2000 operating systems, and works with layered-driver applications (for example, SAN Copy™, SnapView™ and MirrorView™/A devices), and non-layered-driver devices.

Use **admhost** commands to

- ◆ Scan for new storage devices
- ◆ Assign drive letters to the devices
- ◆ Make storage devices inaccessible to the server operating system
- ◆ Flush cache data to disk
- ◆ List drive letters and worldwide names for all server devices

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**Important** The Admhost Utility is supported on CX-Series, FC-Series, and AX-Series storage systems that have been upgraded to Navisphere Manager, that is, that have the Navisphere Manager Enabler installed.

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## Admsnap Utility

The Admsnap Utility is an executable program that you can run interactively or via a script to manage SnapView clones and snapshots. The Admsnap Utility resides on the servers connected to the storage system with the SnapView driver installed. Admsnap runs on Microsoft Windows Server 2003 or Windows 2000.

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**Important** Unless indicated otherwise, all references to a Windows server refer to Windows Server 2003 or Windows 2000 servers only.

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Use **admsnap** commands to:

- ◆ Scan for new storage devices
- ◆ Assign drive letters to the devices
- ◆ Make storage devices inaccessible to the server operating system
- ◆ Flush cache data to disk
- ◆ List drive letters and worldwide names for all server devices
- ◆ List current snapshot devices
- ◆ Map and unmap to a SnapView session
- ◆ Start and stop a SnapView session

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**Important** The Admsnap Utility is supported on CX-Series, FC-Series, and AX-Series storage systems that have been upgraded to Navisphere Manager, that is, that have the Navisphere Manager Enabler installed.

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## CLARiiON VSS Provider

The CLARiiON VSS Provider allows an application to access SnapView functionality on CLARiiON storage systems by using the VSS framework and other APIs introduced in Microsoft Windows Server 2003 APIs.

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**Important** The CLARiiON VSS Provider is supported on CX-Series and AX-Series storage systems that have been upgraded to Navisphere Manager, that is, that have the Navisphere Manager Enabler installed.

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## 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. For more information, refer to the *EMC Navisphere Command Line Interface (CLI) Reference Guide*.

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**Important** The Navisphere CLI is supported on CX-Series, FC-Series, and AX-Series storage systems that have been upgraded to Navisphere Manager, that is, that have the Navisphere Manager Enabler installed.

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## Installing and Using the Navisphere Storage System Initialization Utility

This chapter describes how to install and use the Navisphere Storage System Initialization Utility on a Windows host connected to the same subnet as the management ports on a storage system.

Major topics are

- ◆ Requirements for the Navisphere Storage System Initialization Utility ..... 2-2
- ◆ Installing the Navisphere Storage System Initialization Utility..2-3
- ◆ Using the Navisphere Storage System Initialization Utility ..... 2-6

## Requirements for the Navisphere Storage System Initialization Utility

To use the Navisphere Storage System Initialization Utility on a Windows host to initialize a storage system, the host must meet the following requirements:

- ◆ Run a supported version of the Windows Server 2003 or Windows 2000 operating system.
- ◆ Be connected to the *same subnet* as the 10/100 management ports of the storage system that you want to initialize. This host may also be a server with Fibre Channel or iSCSI connections to the storage system.

You can run the Navisphere Storage System Initialization Utility from the server support CD as described in *To run the utility from the CD* on page 2-6. EMC recommends that you install the utility on the server, as described in *Installing the Navisphere Storage System Initialization Utility* on page 2-3.

## Installing the Navisphere Storage System Initialization Utility

You can install the Initialization Utility on a VMware® Windows Virtual Machine, but do *not* install the Initialization Utility on a VMware® ESX Server™.

1. Log in to the Windows server as the administrator or someone who has administrative privileges.
2. In the server's drive, insert the server support CD that shipped with your storage system or your upgrade kit (for AX-Series systems upgrading to Navisphere Manager).

The server support menu opens.

If you do *not* see the server support menu, follow these steps to open it:

- a. From the Windows taskbar, select

**Start > Run**

- b. In the **Run** dialog box, enter the following program name, and then click **OK**:

*drive*:\CXSeries.exe

or

*drive*:\AXSeries.exe

where *drive* is the letter for the CD drive.

3. From the main menu select **Install Products on Server**.  
The **INSTALL PRODUCTS** page opens.
4. Select **Navisphere Storage System Initialization Utility**.
5. In the **Navisphere Storage System Initialization Utility Wizard - Welcome** dialog box, click **Next**.
6. In the **Navisphere Storage System Initialization Utility - Installation Folder** dialog box, enter the folder where the files will be unpacked and click **Continue**.

7. Depending if this is a new installation or an upgrade, do one of the following:
  - **New Installation**
    - a. In the **Navisphere Storage System Initialization Wizard** dialog box, click **Next** at the **Welcome** screen.
    - b. In the Customer Information dialog box, enter your name and your company's name, and click **Next**.
    - c. In the **Choose Destination Location** dialog box, click **Next** to select the default location or click **Browse** to specify a new location.

If you are running Windows Server 2003 (32-bit) or Windows 2000, the default location is *drive:\Program Files\EMC\Navisphere Storage System Initialization Utility*

If you are running Windows Server 2003 (64-bit) the default location is *drive:\Program Files (x86)\EMC\Navisphere Storage System Initialization Utility*
  - **Upgrade** – If the Storage System Initialization Utility is already installed, you are prompted with a message asking you if you would like to upgrade. Click **Yes** to perform the upgrade.

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The Navisphere Storage System Initialization Utility is installed in the same location as the previous revision.

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8. In the **InstallShield Wizard Complete** screen, click **Finish** to exit the wizard.
9. Close the server support menu by selecting **Main Menu** and then **Exit**.
10. Remove the CD from the server's CD-ROM drive.

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## To remove the Navisphere Storage System Initialization Utility

1. On the Windows server running the Storage System Initialization Utility that you want to remove, log in as the administrator or the equivalent.
2. Select **Start > Settings > Control Panel**.
3. On the **Control Panel** pane, double-click **Add/Remove Programs**.  
The **Add/Remove Programs** dialog box opens.
4. Select **Navisphere Storage System Initialization Utility** and click **Change/Remove**.
5. If asked to confirm the removal, click **OK**.  
You have removed the application.

## Using the Navisphere Storage System Initialization Utility

You run the Navisphere Storage System Initialization Utility from a host on which it is installed or from the server support CD.

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### To run the utility from a host

To start the utility from the default installation directory, select **Start > Programs > EMC > Navisphere > Navisphere Storage System Initialization Utility**. For more information on using the Navisphere Storage System Initialization Utility, click **Help** from the wizard's **Help** menu.

---

### To run the utility from the CD

1. Log in to the Windows server as the administrator or someone who has administrative privileges.
2. In the server's drive, insert the server support CD that shipped with your storage system or your upgrade kit (for AX-Series systems upgrading to Navisphere Manager).  
The server support menu opens.  
If you do *not* see the server support menu, follow these steps to open it:
  - a. From the Windows taskbar, select  
**Start > Run**
  - b. In the **Run** dialog box, enter the following program name, and then click **OK**:  
*drive:\CXSeries.exe*  
or  
*drive:\AXSeries.exe*  
where *drive* is the letter for the CD drive.
3. From the main menu select **Run Products from CD**.  
The **RUN PRODUCTS** page opens.
4. Select **Navisphere Storage System Initialization Utility**.

## Installing and Using the Navisphere Host Agent or Server Utility

This chapter describes how to install the Navisphere Host Agent and the Navisphere Server Utility. You cannot install the Host Agent and the Navisphere Server Utility on the same server (the host that sends I/O). However, they can be installed on different servers that are connected to the same storage system.

Major topics are

### Overview

- ◆ Determining which application to install.....3-2
- ◆ Host Agent and Server Utility requirements .....3-4

### Navisphere Host Agent

- ◆ Installing the Navisphere Host Agent .....3-5
- ◆ Using the Host Agent .....3-12

### Navisphere Server Utility

- ◆ Installing the Navisphere Server Utility .....3-14
- ◆ Using the Navisphere Server Utility .....3-17

## Determining which application to install

Depending on your application needs, you can install either the Host Agent or Server Utility on an attached Windows server. You cannot install both applications on the same server; however, you can install them on different servers attached to the same storage system.

If you have an AX-Series storage system running Navisphere Express, you *must* install the Server Utility; the Host Agent is only supported on CX-Series and AX-Series storage systems running Navisphere Manager.

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**Important** If you have VMware® ESX Server™ with native multipathing software installed, the Server Utility will not always display all paths to the storage system. However, at least one path to the storage system will always display.

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Table 3-1 on page 3-3 describes the differences between the Host Agent and the Server Utility on a Windows server attached to a CX-Series storage system or an AX-Series storage system running Navisphere Manager.

Table 3-1 Differences between the Host Agent and the Server Utility

Function	Host Agent	Server Utility	
		AX-Series	CX-Series
Pushes LUN mapping and OS information to the storage system.	<b>Yes</b> – LUN mapping information displays in the Manager UI, next to the LUN icon, or with the CLI using the <b>-lunmapinfo</b> command.	<b>Yes</b> – LUN mapping information displays in the Manager UI, next to the LUN icon, or with the CLI using the <b>-lunmapinfo</b> command. Note: The text <b>Manually Registered</b> appears next to the host name icon in the Manager UI indicating that the Host Agent is not installed on this server.	<b>No</b> – LUN mapping information is not sent to the storage system. Only the host's name, ID, and IP address are sent to the storage system. Note: The text <b>Manually Registered</b> appears next to the host name icon in the Manager UI indicating that the Host Agent is not installed on this server.
Runs automatically to send information to the storage system.	<b>Yes</b> – No user interaction is required.	<b>Yes</b> and <b>No</b> – You can control whether server information is automatically sent to the storage system by enabling or disabling the <b>Registration Service</b> feature. It is automatically enabled during the installation of the Server Utility but you can stop the service at anytime through the <b>Services</b> option in the Microsoft UI.	<b>Yes</b> and <b>No</b> – You can control whether server information is automatically sent to the storage system by enabling or disabling the <b>Registration Service</b> feature. It is automatically enabled during the installation of the Server Utility but you can stop the service at anytime through the <b>Services</b> option in the Microsoft UI. However, there is no benefit in enabling the <b>Registration Service</b> on a server connected to a CX-Series system, since LUN mapping information is not sent.
Requires network connectivity to the storage system.	<b>Yes</b> – Network connectivity allows LUN mapping information to be available to the storage system.	<b>No</b> – LUN mapping information is sent through a data path to the storage system.	<b>No</b> – LUN mapping information is not sent to the storage system.
Requires installation.	<b>Yes</b> – You must install the Host Agent on the server.	<b>No</b> – You can run the Server Utility from the CD. However, we recommend that you install it on the server. You must install it to use the <b>Registration Service</b> feature (described above).	<b>No</b> – You can run the Server Utility from the CD. However, we recommend that you install it on the server. You must install it to use the <b>Registration Service</b> feature (described above).

## Host Agent and Server Utility requirements

To run the Windows Host Agent or Server Utility on your server, the server must meet the following requirements:

- ◆ Run a supported version of the Windows Server 2003 or Windows 2000 operating system.
- ◆ Have the EMC CLARiiON supported HBA hardware and driver installed.
- ◆ Be connected to each SP in each storage system either directly or through a switch or hub.
- ◆ *For the Host Agent only* – Be on a TCP/IP network connected to each SP in the storage system. The TCP/IP network connection allows the server to send LUN mapping information to the storage system and it allows Manager to communicate with the storage system over the network.

For information about the specific revisions of the server operating system and the storage-system FLARE™ or Access Logix software that are required for your revision of the Host Agent, see the Release Notes for the Host Agent on the EMC Powerlink website. To access this website, see *Finding current information* on page x.

---

## Installing the Navisphere Host Agent

This section describes how to install the Navisphere Host Agent on a server connected to a CX-Series, AX-Series running Navisphere Manager, or FC4700 storage system.

---

**Important** You cannot install the Host Agent and the Server Utility on the same server. However, you can install them on different servers that are connected to the same storage system. If the Server Utility is installed, remove it before installing the Host Agent, see *To remove the Server Utility* on page 3-16.

---

Do *not* install the Host Agent on a VMware Windows Virtual Machine.

---

### To install the Host Agent

1. Ensure that all storage systems are connected to the Windows server on which you are installing Host Agent.
2. Log in to the Windows server as the administrator or a user who has administrative privileges.
3. In the server's drive, insert the server support CD that shipped with your storage system or your upgrade kit (for AX-Series systems upgrading to Navisphere Manager).

The server support menu opens.

If you do *not* see the server support menu, follow these steps to open it:

- a. From the Windows taskbar, select

**Start > Run**

- b. In the **Run** dialog box, enter the following program name, and then click **OK**:

*drive*:\CXSeries.exe

where *drive* is the letter for the CD drive.

4. From the main menu select **Install Products on Server**.

The **INSTALL PRODUCTS** page opens.

5. Select **Navisphere Host Agent**.
6. In the **Navisphere Agent Setup** dialog box, click **Next** at the **Welcome** screen.
7. In the **License Agreement** dialog box, read the license agreement, and click **Yes** to accept the terms.
8. In the **Customer Information** dialog box, enter the appropriate information, and click **Next**.
9. In the **Choose Destination Location** dialog box, click **Next** to select the default location.

When you are prompted about using the Microsoft iSCSI Initiator, click **Yes** if Microsoft iSCSI Software Initiator is installed on the server.

Depending on your operating system, the default location is one of the following:

- On Windows Server 2003 (32-bit) or Windows 2000 systems  
*drive:\Program Files\EMC\Navisphere Agent*
- On Windows Server 2003 (64-bit) systems  
*drive:\Program Files (x86)\EMC\Navisphere Agent*

The setup program copies files to the destination folder, and then it displays the message

`Navisphere Agent Service installed successfully.`

10. In the **Navisphere Agent Installer** dialog box, click **OK**.

The **Initialize Privileged User List** dialog box opens so you can add privileged users to a new or existing Host Agent configuration file.

If a filename does not appear in the **Config File**, a Host Agent configuration file does *not* exist on the server, so continue to step 11 to use the **Create/Overwrite File** option.

If a Host Agent configuration file exists on the server, go to step 12 to use the **Use Existing File** option.

11. To create or overwrite a configuration file, do the following:
  - a. Click **Create/Overwrite File**.
  - b. Enter the pathname in **Config File**.
  - c. Skip to step 13.

12. To use the existing configuration file, do the following:
  - a. Click **Use Existing File**.

The pathname of the file appears in the **Config File**.
  - b. If you want to use a different file, either enter the full pathname of the file or select **Browse** to find the file.
13. Make sure the **Privileged User List** contains entries for only those users allowed to configure storage systems connected to the server.

---

You must specify at least one privileged user who can log in to the Navisphere management station and configure the Host Agent. If you do not specify a privileged user, an error message appears when you attempt to exit this dialog box.

---

To add a user to the list:

- a. Click **Add**.

The **Add Privileged User** dialog box opens.
- b. In **User Name**, enter the person's user account name.
- c. In **System Name**, enter the name of the server running Manager.
- d. Click **OK**.

To remove a privileged user from the list:

- a. Select the **privileged user** name.
  - b. Click **Remove**.
14. Click **OK** to save the new privileged user list and/or the new configuration file.

The program saves the Host Agent configuration file with the new privileged user entries and starts the Host Agent.

15. In the **Navisphere Agent Setup** dialog box, click **Finish**.

A command line window opens indicating that the Host Agent service is starting.
16. If you are prompted to reboot the server, click **Yes**.

If you do not reboot before you run the Microsoft iSCSI Software Initiator, the NIC initiators will not be able to login to the storage system.

17. If you installed a new version of the Host Agent and will be using Event Monitor, refer to *Using the Event Monitor configuration file* on page 3-11.

If you updated the Host Agent and were using Event Monitor, restore the Event Monitor configuration from a previously copied **Navimon.cfg** file:

- a. Stop the Agent, as described on page 3-13, *Stopping the Host Agent service*.
  - b. Move or copy the saved **Navimon.cfg** to the real **Navimon.cfg** file, as described on page 3-12, *Starting the Host Agent service*.
  - c. Start the Agent, as described on page 3-12, *Starting the Host Agent service*.
18. If you are managing pre-FC4700 storage systems, you must edit the Host Agent configuration file to add device entries for each storage system the server will communicate with. To edit the Host Agent configuration file use one of the following:
    - the Remote Agent Configuration feature of Manager as described in the *EMC Navisphere Manager Administrator's Guide*.
    - the CLI **remoteconfig** command as described in the *Navisphere Command Line Interface (CLI) Reference Manual*.

---

When a pre-FC4700 storage system experiences heavy input/output traffic (that is, applications are using the storage system), information may not be reported to the Host Agent in a timely manner. In such a situation, the Host Agent may take several minutes to execute a storage-system management task. This behavior is most evident when one Host Agent is managing multiple storage systems. Also, if the SP event log is large and the Host Agent configuration file is set up to read all the events, it may take a few minutes for the Host Agent to start.

---

19. If you have an iSCSI configuration with a multi-homed server (multiple NIC cards installed on the server), and are running Windows Server 2003 or Windows 2000, do the following to ensure that the Agent finds the correct NIC card:
  - a. Create a text file in the Host Agent directory and name it **agentid.txt**.
  - b. Open the **agentid.txt** file and on the first line, type the fully qualified domain name of the host that you want to display in Navisphere.

- c. On the second line, type the IP address that you want to display in Navisphere.
- d. Save the file and then stop and start the Agent.

**What next?**

What you do next depends on whether you will use Navisphere Manager to manage the storage systems connected to the server.

**Using Manager** — If you are setting up a new server, go to the section *Starting the Host Agent service* on page 3-12. If you are just upgrading the Host Agent or CLI on an existing system, you have finished the upgrade.

**Using CLI** — Continue to the section *Starting the Host Agent service* for information on how you can monitor storage-system events.

---

## To remove the Host Agent

---

To avoid losing site-specific information, copy the Host Agent configuration file (**agent.config**) and the Event Monitor configuration file (**Navimon.cfg**) to a safe location or rename it before removing any Navisphere software.

---

1. On the Windows server running the Host Agent that you want to remove, log in as the administrator or the equivalent.
2. Stop the Host Agent service as follows:
  - a. From the desktop, right-click **My Computer** and select **Manage > Services and Applications > Services**. The **Services** pane opens.
  - b. Stop the Host Agent:
    - In the **Services** pane, right-click **Navisphere Agent** and select **Stop**.
    - If asked to confirm your request to stop the Agent service, click **Yes**.
  - c. Close the **Services** pane.
3. Select **Start > Settings > Control Panel**.
4. On the **Control Panel** pane, double-click **Add/Remove Programs**. The **Add/Remove Programs** pane opens.
5. Select **Navisphere Agent** and click **Change/Remove**, and if asked to confirm the removal, click **OK**. The **InstallShield Wizard** dialog box opens.
6. When asked to remove the entire Navisphere Agent directory, click **Yes** or **No**. If you select **Yes**, the software removes the entire Navisphere Agent directory, which includes the **agent.config** and **Navimon.cfg** files. This file contains all site-specific Agent configurations from the server.

If you click **Yes**, a confirmation dialog opens asking if you want to proceed. Click **Yes**, to proceed and remove the entire Navisphere Agent directory or click **No**, to cancel the removal of this directory.

7. If prompted to remove shared files, click **Yes**, and/or if informed that the service has already been removed, click **Yes** or **OK**.

The **InstallShield Wizard** dialog box opens.

8. Click **Finish**.

You have removed the application.

---

## Using the Event Monitor configuration file

Navisphere Host Agents can monitor storage-system events and take such action as sending e-mail or paging you if specified events occur. The Event Monitor software that ships with Navisphere Manager provides an interactive way to define these events and actions. If you do not have Event Monitor, you can still define such events and actions by editing the Event Monitor configuration file:

- ◆ On Windows Server 2003 (32-bit) or Windows 2000 systems  
*drive:\Program Files\EMC\Navisphere Agent\Navimon.cfg*
- ◆ On Windows Server 2003 systems (64-bit)  
*drive:\Program Files (x86)\EMC\Navisphere Agent\Navimon.cfg*

The file is self-documenting; that is, text in it describes how to define events and what actions to take if the events occur. To test the file after editing it, use the Navisphere CLI command **responsetest**, as explained in the *Navisphere Command Line Interface (CLI) Reference*.

### What next?

If you are upgrading the Host Agent, you have finished the upgrade.

If you are setting up a new server, continue to the next section, *Starting the Host Agent service*.

---

## Using the Host Agent

This section describes how to start and stop the Host Agent service. This section also describes how to configure the storage system connected to the server.

---

### Starting the Host Agent service

If the Navisphere Host Agent service is not set to start automatically at system startup, do the following:

1. At the Windows server, log in as the administrator or the equivalent.
2. From the desktop, right-click **My Computer** and select **Manage > Services and Applications > Services**.  
The **Services** pane opens.
3. In the **Services** pane, right-click **Navisphere Agent** and select **Start**.
4. If you want the Host Agent to start automatically at system startup:
  - a. Right-click **Navisphere Agent** and select **Properties**.  
The **Navisphere Agent Properties** dialog box opens.
  - b. Select the **General** tab.
  - c. In **Startup Type**, select **Automatic**.

The Host Agent will now start automatically at system startup.

5. Close **Computer Management**.

It may take a few minutes for the Host Agent to start in either of the following situations:

- ◆ Applications are using the storage system.
- ◆ The SP event log is large and the Host Agent configuration file is not set up.

---

## Stopping the Host Agent service

To stop the Host Agent service, do the following:

1. At the Windows server, log in as the administrator or the equivalent.
2. From the desktop, right-click **My Computer** and select **Manage > Services and Applications > Services**.  
The **Services** pane opens.
3. In the **Services** pane, right-click **Navisphere Agent** and select **Stop**.
4. If asked to confirm your request to stop the Agent service, click **Yes**, and close the **Services** pane or dialog box.

---

## Configuring storage systems

The next step is to configure the storage systems connected to the server. EMC recommends that you use Navisphere Manager, instead of the CLI, to configure storage systems, as described in the *EMC Navisphere Manager Administrator's Guide*.

---

## Installing the Navisphere Server Utility

This section describes how to install the Navisphere Server Utility on a server connected to a CX-Series or AX-Series storage system.

---

**Important** If you have installed the Navisphere Host Agent, do not install the Navisphere Server Utility on the same server. If you want to install the Server Utility on a server that is currently running the Host Agent, you must remove the Host Agent before installing the Server Utility.

Do *not* install the Server Utility on a VMware Windows Virtual Machine. You can install the utility on a VMware® ESX Server™, which is described in the *EMC CLARiiON Server Support Products for Linux and ESX Server Installation Guide* (P/N 300-002-041).

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---

### To install the Server Utility

You can run the Server Utility from the server support CD, as described in *To run the Server Utility from the CD* on page 3-17, but EMC recommends that you install the utility on the server. On AX-Series systems, some features are not available unless you install the Server Utility on the server.

---

If the server will connect to the storage system through NICs, you must install the Microsoft iSCSI Software Initiator before installing the Server Utility.

If your server is connected *only* to an AX100-Series storage system running Navisphere Server Utility version 2.19 or lower, and you are adding an AX150-Series storage system, you must install the version that shipped with your AX150-Series system.

---

1. Ensure that all storage systems are connected to the Windows server on which you are installing Server Utility.
2. Log in to the Windows server as the administrator or someone who has administrative privileges.

3. In the server's drive, insert the server support CD that shipped with your storage system or your upgrade kit (for AX-Series systems upgrading to Navisphere Manager).

The server support menu opens.

If you do *not* see the server support menu, follow these steps to open it:

- a. From the Windows taskbar, select

**Start > Run**

- b. In the **Run** dialog box, enter the following program name, and then click **OK**:

*drive*:\CXSeries.exe

or

*drive*:\AXSeries.exe

where *drive* is the letter for the CD drive.

4. From the main menu select **Install Products on Server**.
5. From the **Install Products** menu, click **Navisphere Server Utility** to open the installation wizard.
6. Follow the instructions on the screen and *accept all the defaults*.

---

**AX-Series** - If you are installing version 6.20 or higher, do not disable the **Registration Service** option (it is enabled by default as part of the **Complete** setup type). The **Registration Service** option automatically registers the server's NICs or HBAs with the storage system after the installation and updates server information to the storage system whenever the server configuration changes (for example, you mount new volumes or create new partitions).

---

7. If you are prompted about updating information when the server starts, click **Yes**.
8. If the installation dialog prompts you to reboot the server, click **Yes**.

---

You must reboot the server when the installation dialog prompts you to reboot. If the server is connected to the storage system with NICs and you do not reboot before you run the Navisphere Server Utility, the NIC initiators will not log in to the storage system.

---

9. Click **Finish** to exit the wizard.
10. Remove the CD from the server's CD drive

For more information on using the Server Utility, click **Help** from the wizard's **Help** menu.

---

### To remove the Server Utility

1. On the Windows server running the Server Utility that you want to remove, log in as the administrator or the equivalent.
2. Select **Start > Settings > Control Panel**.
3. On the **Control Panel** pane, double-click **Add/Remove Programs**.  
The **Add/Remove Programs** pane opens.
4. Select **Navisphere Server Utility** or **Navisphere Server Utility (AX)** and click **Change/Remove**, and if asked to confirm the removal, click **OK**.

You have removed the application.

---

## Using the Navisphere Server Utility

You run the Navisphere Server Utility from a host on which it is installed or from the server support CD.

---

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

---

---

### To run the Server Utility from a host

To start the Server utility from the default installation directory, select **Start > Programs > EMC > Navisphere > Navisphere Server Utility**. For information on using the Navisphere Server Utility, click **Help** from the utility's **Help** menu.

---

### To run the Server Utility from the CD

1. Log in to the Windows server as the administrator or someone who has administrative privileges.
2. In the server's drive, insert the server support CD that shipped with your storage system or your upgrade kit (for AX-Series systems upgrading to Navisphere Manager).

The server support menu opens.

If you do *not* see the server support products menu, follow these steps to open it:

- a. From the Windows taskbar, select

**Start > Run**

- b. In the **Run** dialog box, enter the following program name, and then click **OK**:

*drive*:\CXSeries.exe

or

*drive*:\AXSeries.exe

where *drive* is the letter for the CD drive.

3. From the main menu select **Run Products from CD**.
4. From the **Run Products** menu, select **Navisphere Server Utility**.



## Installing and Using the Admhost and Admsnap Utility

This chapter describes how to install the Admhost Utility, Admsnap Utility, and the CLARiiON VSS Provider. This chapter also describes how to use admhost and refers you to the documentation that describes how to use admsnap.

The Admhost and Admsnap Utilities are supported only on CX-Series and AX-Series storage systems running Navisphere Manager.

Major topics are

### **Admhost Utility**

- ◆ Installing the Admhost Utility ..... 4-2
- ◆ Using the Admhost Utility ..... 4-4

### **Admsnap Utility**

- ◆ Installing the Admsnap Utility ..... 4-6
- ◆ Using the Admsnap Utility ..... 4-8

### **CLARiiON VSS Provider**

- ◆ Installing the CLARiiON VSS Provider ..... 4-9
- ◆ Using the CLARiiON VSS Provider ..... 4-11

## Installing the Admhost Utility

The Admhost Utility is supported only on the following Microsoft Windows platforms: Windows Server 2003 or Windows 2000.

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For the supported versions of these operating systems, see the *Admhost Release Notes*.

---

---

### To install the Admhost Utility on a server

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If you have VMware ESX Server, install the admhost utility on the VMware Windows Virtual Machine.

---

1. Log in to the Windows server or VMware Windows Virtual Machine as the administrator or as someone who has administrator privileges.
2. You cannot install admhost over an existing revision. If you think admhost is already installed, remove it using the sequence:

**Start > Settings > Control Panel > Add/Remove Programs > Navisphere Admhost**

and click **Add/Remove**.

3. In the server's drive, insert the server support CD that shipped with your storage system or your upgrade kit (for AX-Series systems upgrading to Navisphere Manager).

The server support menu opens.

If you do *not* see the server support menu, follow these steps to open it:

- a. From the Windows taskbar, select

**Start > Run**

- b. In the **Run** dialog box, enter the following program name, and then click **OK**:

*drive*:\CXSeries.exe

where *drive* is the letter for the CD drive.

4. From the main menu select **Install Products on Server**.

The **INSTALL PRODUCTS** page opens.

5. Select **Admhost Utility** and then select the Windows operating system running on the server. The following three options are available:

- Windows Server 2003
- Windows 2000

The **Navisphere Admhost Setup** page opens.

6. Click **Next** to continue.

The **License Agreement** dialog box appears.

7. Click **Yes** to accept the agreement.

The **Setup Customer Information** dialog box appears.

8. If your name and company name are not displayed correctly, type them and click **Next**.

The **Choose Destination Location** dialog box appears.

9. Click **Next** to choose the default destination folder, **C:\Program Files\EMC\Navisphere Admhost**, or click **Browse** to select a different drive and/or destination folder.

The **Select Program Folder** dialog box opens.

10. Click **Next** to select the default program folder to hold the program icons, or choose another folder.

Setup installs the admhost files in the location you specified.

11. An **Installation Wizard Complete** dialog box appears.

Click **Finish** to close the dialog box.

12. Remove the CD-ROM from its drive and store it safely.

You have installed the admhost software on a Windows server or the VMware Windows Virtual Machine. If you selected the default destination folder, admhost is installed in the directory **C:\Program Files\EMC\Navisphere Admhost**.

## Using the Admhost Utility

Table 4-1 lists the **admhost** commands and describes their function in SAN Copy sessions.

Table 4-1 **admhost functions and descriptions**

Function	Description	Syntax and Examples
<b>admhost lun_activate</b>	<p>The <b>admhost lun_activate</b> command scans the bus for new devices and assigns a drive letter to all Symmetrix and CLARiiON devices that do not already have one.</p> <p>Use the <b>-l</b> and <b>-d</b> switches to scan the bus for new devices and assign a drive letter to a device that has a specific world wide name (WWN). This command does not assign drive letters to any other devices.</p> <p>If <b>admhost_activate</b> is used and no new devices are found, and drive letters are already assigned to the CLARiiON and Symmetrix logical units, <b>admhost</b> reports an error message.</p>	<p><b>admhost lun_activate</b>  <b>[-l lun_wwn -d driveletter][-h]</b>  where  <b>-l lun_wwn</b> specifies the WWN of the LUN to which you want to assign a drive letter (requires the <b>-d</b> switch).  <b>-d driveletter</b> specifies the drive letter you want to assign to the specified LUN (requires the <b>-l</b> switch).  <b>-h</b> displays the help message</p> <p>If the <b>admhost lun_activate</b> command activates more than one device, the drive letter is assigned to the first device in the list.</p>
<b>admhost lun_deactivate</b>	<p>The <b>admhost lun_deactivate</b> command attempts to take devices offline and make them inaccessible to the operating system. The command deletes the drive letter and dismounts the device.</p> <p>Use the <b>admhost lun_activate</b> command to bring the volume back online.</p>	<p><b>admhost lun_deactivate</b>  <b>-o objectName [-t object type][-h]</b>  where  <b>-o objectName</b> specifies the drive letter of the device you want to deactivate.  If you specify the device name, <b>admhost</b> finds the device, deletes its drive letter, dismounts it, and then takes the device offline.  <b>-t object_type</b> is an optional switch that specifies the object type (<b>device</b> or <b>driveletter</b>) of the device you want to deactivate.  <b>-h</b> displays the help message</p>

Function	Description	Syntax and Examples
<b>admhost lun_flush</b>	The <b>admhost lun_flush</b> command flushes all write cache data, for the specified device ( <i>object_name</i> ) to disk.	<b>admhost lun_flush [-h] -o <i>object_name</i> [-t <i>object_type</i> <i>device</i><i>driveletter</i>]</b> where <b>-h</b> displays a help message <b>-o <i>object_name</i></b> specifies the name or drive letter of the device you want to flush. <b>-t <i>object_type</i></b> is an optional switch that specifies the object type ( <b>device</b> or <b>driveletter</b> ) of the device you want to flush. If you specify the device name, <b>admhost</b> identifies the corresponding device and drive letter.
<b>admhost lun_list</b>	The <b>admhost lun_list</b> command lists the drive letters and WWNs for all server devices.	<b>admhost lun_list [-h] [-l <i>lun_wwn</i>] [-d <i>object_name</i>] [-a <i>output_style</i>]</b> where <b>-h</b> displays a help message. <b>-l <i>lun_wwn</i></b> specifies the WWN of the device you want to list. <b>-d <i>object_name</i></b> specifies the drive letter or name of the device you want to list. <b>-a <i>output_style</i></b> specifies an alternative output style for the list output. The default style lists the drive letter and WWN for the logical unit. The <b>-a</b> switch lets you specify <i>physicaldrive</i> as the output style.
<b>admhost help</b>	This <b>admhost help</b> command displays the syntax for each <b>admhost</b> command and the revision number of the Admhost Utility. Output for <b>admhost help</b> command is shown below. Revision number: V1.1.0.0.0 - 0 Valid operations include: lun_flush, lun_activate, lun_deactivate, lun_list, and help. Valid types include: device and driveletter.	<b>admhost help</b>

## Installing the Admsnap Utility

We strongly recommend that you install admsnap on all Windows servers connected to a storage system with the SnapView driver installed. The Admsnap Utility is supported only on the following Microsoft Windows platforms: Windows Server 2003 or Windows 2000.

**Important** If you are upgrading your storage system to FLARE OE version 02.19.xxx.5.yyy or higher, you *must* upgrade admsnap to version 2.9.x or higher. Before you upgrade FLARE, verify that your operating system version supports admsnap version 2.9.x or higher. Refer to the *Admsnap Release Notes* or the *EMC Support Matrix* on Powerlink.

---

For the supported versions of these operating systems, see the *Admsnap Release Notes*.

---

---

### Installation prerequisites

Before you can install and use the Admsnap Utility, you must install:

- ◆ SnapView on a supported CLARiiON storage system. For a list of supported storage systems, refer to the release notes for SnapView and admsnap.
- ◆ Access Logix on the same CLARiiON storage system.

---

### To install the Admsnap Utility

---

If you have VMware ESX Server, install the admsnap utility on the VMware Windows Virtual Machine.

---

1. Log in to the Windows server or the VMware Windows Virtual Machine as the administrator or as someone who has administrative privileges.
2. If admsnap is already installed, refer to page 4-8 to remove it.

---

The remove step is needed because the installation program will not let you install admsnap over an existing revision.

---

3. In the server's drive, insert the server support CD that shipped with your storage system or your upgrade kit (for AX-Series systems upgrading to Navisphere Manager).

The server support menu opens.

If you do *not* see the server support menu, follow these steps to open it:

- a. From the Windows taskbar, select

**Start > Run**

- b. In the **Run** dialog box, enter the following program name, and then click **OK**:

*drive*:\CXSeries.exe

where *drive* is the letter for the CD drive.

4. From the main menu select **Install Products on Server**.

The **INSTALL PRODUCTS** page opens.

5. Select **Admsnap Utility** and then select the Windows operating system running on the server. The following three options are available:

- Windows Server 2003
- Windows 2000

The **Navisphere Admsnap Setup** page opens.

6. Click **Next** to continue. The **License Agreement** dialog box opens.
7. Click **Yes** to accept the agreement. The **Setup Customer Information** dialog box appears.
8. If your name and company name are not displayed correctly, type them and click **Next**. The **Choose Destination Location** dialog box opens.
9. Click **Next** to choose the default destination folder or click **Browse** to select a different drive and/or destination folder.

Depending on your operating system, the default location is one of the following:

- On Windows Server 2003 (32-bit) or Windows 2000 systems  
*drive*:\Program Files\EMC\Navisphere Admsnap
- On Windows Server 2003 (64-bit) systems  
*drive*:\Program Files (x86)\EMC\ Navisphere Admsnap

The **Select Program Folder** dialog box opens.

10. Click **Next** to select the default program folder to hold the program icons, or choose another folder.

Setup installs the admsnap files in the location you specified.

11. An **Installation Wizard Complete** dialog box appears.

Click **Finish** to close the dialog box.

12. Remove the CD-ROM from its drive and store it safely.

You have installed the admsnap software on a Windows server or VMware Windows Virtual Machine.

---

### To remove the Admsnap Utility

If you want to remove the Admsnap Utility, select **Start > Settings > Control Panel > Add/Remove Programs > Navisphere Admsnap** and click **Remove**.

---

### Using the Admsnap Utility

For information on using the Admsnap Utility, refer to the *EMC SnapView Command Line Interfaces Reference Guide*.

---

## Installing the CLARiiON VSS Provider

The CLARiiON VSS Provider is supported on Windows Server 2003 and VMware ESX Servers running Windows Server 2003 on the Virtual Machine. However, you can only use the ESX Server as the production server. The ESX Server cannot be used as the secondary server, and therefore cannot access the copy.

---

For the supported versions of this operating system, see the *Admsnap Release Notes*.

---

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### Installation prerequisites for a storage system with Navisphere Manager

Before you can install and use the CLARiiON VSS Provider, you must install:

- ◆ SnapView on a supported CLARiiON storage system. For a list of supported storage systems, refer to the release notes for SnapView and admsnap.
- ◆ Access Logix on the same CLARiiON storage system.
- ◆ Navisphere Command Line Interface (CLI) on the same server on which you will install the CLARiiON VSS Provider.
- ◆ Navisphere Host Agent or the Navisphere Server Utility on the server that you will install the CLARiiON VSS Provider. All servers attached to the CLARiiON storage system must have either the Host Agent or the Server Utility installed.

---

### Installation prerequisites for a storage system with Navisphere Express

Before you can install and use the CLARiiON VSS Provider, you must install the Navisphere Server Utility on the same server as the CLARiiON VSS Provider. All servers attached to the AX-Series storage system must also have the Server Utility installed.

## To install the CLARiiON VSS Provider

From the server that has Navisphere Command Line Interface (CLI) installed, follow the procedure below to install the CLARiiON VSS Provider. If you have an AX-Series storage system *and* if CLI is not installed on the server attached to the AX-Series storage system, you must install the VSS Provider from the server support CD that shipped with your AX-Series storage system. This version of the VSS Provider will also install the Navisphere CLI on the server.

1. Insert the server support CD that shipped with your storage system in the CD-ROM drive.
2. From the main menu, select **Install Products on Server**.
3. From the **Install Products** page, select VSS Provider and follow the InstallShield wizard instructions.

Unless you specify another folder, the CLARiiON VSS Provider executable will be installed in the following default location:

**C:\Program Files\EMC\CLARiiON VSS Provider**

For AX-Series storage systems without Navisphere CLI, Navisphere CLI will be installed in the following default location:

**C:\Program Files\EMC\Navisphere CLI**

4. Remove the CD from the CD-ROM drive.
5. Create a file called **ClariionSPAddress** in the same directory where you installed Navisphere CLI, for example, **C:\Program Files\EMC\Navisphere CLI\ClariionSPAddress**.

The **ClariionSPAddress** file should contain the IP addresses of each CLARiiON SP on a separate line. For instance, if you are performing VSS operations on LUNs contained on two CLARiiON systems and these systems are connected to the server, their IP address's are listed as follows:

*Storage System 1 SPA = x.x.x.110*

*Storage System 1 SPB = x.x.x.111*

*Storage System 2 SPA = x.x.x.112*

*Storage System 2 SPB = x.x.x.113*

Then the contents of the **ClariionSPAddress** file would be:

x.x.x.110

x.x.x.111

x.x.x.112

x.x.x.113

---

## To remove the CLARiiON VSS Provider

If you want to remove the CLARiiON VSS Provider, select **Settings > Control Panel > Add or Remove Programs > CLARiiON VSS Provider** and click **Remove**.

---

## Using the CLARiiON VSS Provider

The CLARiiON VSS Provider does not have a user interface and is only called by the VSS service built into Windows Server 2003. For information on using VSS Writers or VSS Requestors, refer to the appropriate documentation that shipped with your operating system.



---

This chapter describes how to install Navisphere CLI and refers you to the documentation that describes how to use Navisphere CLI.

---

CLI is only supported on CX-Series and AX-Series storage systems running Navisphere Manager.

---

Major topics are

- ◆ Navisphere CLI requirements ..... 5-2
- ◆ Installing Navisphere CLI..... 5-3
- ◆ Using Navisphere CLI..... 5-4

## Navisphere CLI requirements

To run the Navisphere CLI, your server must meet the following requirements:

- ◆ Run a supported version of the Windows Server 2003 or Windows 2000 operating system.
- ◆ Have the EMC CLARiiON supported HBA hardware and driver installed.
- ◆ Be connected to each SP in each storage system either directly or through a switch or hub. Each SP must have an IP connection.
- ◆ Be on a TCP/IP network connected to each SP in the storage system. This will allow CLI to communicate with the storage system over the network.

If you want to use the CLI on the server to manage storage systems on a remote server, the server must be on a TCP/IP network connected to both the remote server and each SP in the remote server's storage system. The remote server can be running AIX, HP-UX, IRIX, Linux, NetWare, Solaris, or the Windows operating system.

## Installing Navisphere CLI

If you have a VMware ESX Server, you can install Navisphere CLI on the ESX Server or on a VMware Windows Virtual Machine.

1. Log in to the Windows server, VMware ESX Server, or the VMware Windows Virtual Machine as the administrator or someone who has administrative privileges.
2. If the CLI is already installed, you must remove it, as described in *To remove the CLI* on page 5-4. The installation program does not let you overwrite an existing version.
3. In the server's drive, insert the server support CD that shipped with your storage system or your upgrade kit (for AX-Series systems upgrading to Navisphere Manager).

The server support menu opens.

If you do *not* see the server support menu, follow these steps to open it:

- a. From the Windows taskbar, select

**Start > Run**

- b. In the **Run** dialog box, enter the following program name, and then click **OK**:

*drive:\CXSeries.exe*

where *drive* is the letter for the CD drive.

4. From the main menu select **Install Products on Server**.

The **INSTALL PRODUCTS** page opens.

5. Select **Navisphere CLI**.

If you did not remove a previously installed version of the CLI, a message appears indicating that the software discovered a previous version and cannot continue with the installation until it is removed.

6. In the **Navisphere CLI Setup** dialog box, click **Next** at the **Welcome** screen.
7. In the **License Agreement** dialog box, read the Software License Agreement, and click **Yes** to accept the terms.
8. In the **Customer Information** dialog box, enter the appropriate information (probably the same as for the Agent), and click **Next**.

9. In the **Choose Destination Location** dialog box, click **Next** to select the default location.

Depending on your operating system, the default location is one of the following:

- On Windows Server 2003 (32-bit) or Windows 2000 systems  
*drive:\Program Files\EMC\Navisphere CLI*
- On Windows Server 2003 (64-bit) systems  
*drive:\Program Files (x86)\EMC\Navisphere CLI*

10. In the **Select Program Folder** dialog box, click **Next** to select the default program folder (**Navisphere**).

The setup program copies the files to the program folder.

11. In the **InstallShield Wizard Complete** dialog box, click **Finish** to exit the wizard.
12. Close the server support menu by selecting **Main Menu** and then **Exit**.
13. Remove the CD from the server's CD-ROM drive.

---

## To remove the CLI

1. On the Windows server, VMware ESX Server, or VMware Windows Virtual Machine that is running the CLI that you want to remove, log in as the administrator or the equivalent.
2. Select **Start > Settings > Control Panel**.
3. On the **Control Panel** pane, double-click **Add/Remove Programs**.  
The **Add/Remove Programs** pane opens.
4. Select **Navisphere CLI** and click **Change/Remove**, and if asked to confirm the removal, click **OK**.  
The **InstallShield Wizard** dialog box opens.
5. Click **Finish**.  
You have removed the application.

---

## Using Navisphere CLI

For information on using Navisphere CLI, refer to the *EMC Navisphere Command Line Interface (CLI) Reference*.

## Silent Installations and Removals

This appendix describes how to perform a silent installation or removal of the Navisphere Initialization Utility, Navisphere Host Agent, Navisphere Server Utility, and Navisphere CLI.

**The procedures described in this appendix are intended for advanced users only.**

Major topics are

### Overview

- ◆ About silent installations or removals ..... A-2

### Initialization Utility

- ◆ Installing the Navisphere Initialization Utility ..... A-3
- ◆ Removing the Navisphere Initialization Utility ..... A-6
- ◆ Verifying the silent installation or removal ..... A-32

### Host Agent

- ◆ Installing Navisphere Host Agent ..... A-9
- ◆ Removing the Host Agent ..... A-16
- ◆ Verifying the silent installation or removal ..... A-32

### Server Utility

- ◆ Installing the Navisphere Server Utility ..... A-20
- ◆ Removing the Navisphere Server Utility ..... A-23
- ◆ Verifying the silent installation or removal ..... A-32

### Navisphere CLI

- ◆ Installing Navisphere CLI ..... A-26
- ◆ Removing Navisphere CLI ..... A-29
- ◆ Verifying the silent installation or removal ..... A-32

## About silent installations or removals

A silent installation and removal uses a command line interface to install or remove applications on all attached Windows servers. To perform the installation or removal, you need to create a response file on one of the attached servers. A response file stores the setup configuration, which allows you to install or remove the applications on all remaining attached Windows servers by using one command that requires no user input.

The following Navisphere products support silent installations and removals:

- ◆ Initialization Utility
- ◆ Host Agent
- ◆ Server Utility
- ◆ CLI

---

The procedures described in this appendix are supported on Windows Server 2003 or Windows 2000 operating systems only.

For information on the revisions supported for the Host Agent and CLI, refer to installation section for each application. The Host Agent and CLI are not supported on an AX-Series system with Navisphere Express.

---

## Installing the Navisphere Initialization Utility

We recommend that you install the Navisphere Storage System Initialization Utility on at least one server attached to a CX-Series storage system. It is not required that you install it on every server.

---

**Important** We do not recommend that you install Navisphere Initialization Utility using the command line interface unless you are an advanced user. If you are not, we recommend that you install the utility as described on *Installing the Navisphere Storage System Initialization Utility* on page 2-3.

To perform a silent installation for the Initialization Utility follow the procedure below.

---

### Preparing for the installation

1. Log in to the Windows server as Administrator or someone who has administrative privileges.
2. If the Initialization Utility is already installed, you must remove the program you are updating, as described on page A-6. The installation program does not let you overwrite an existing utility.

---

**Important** To perform a silent removal, all versions of the utility must be running the same revision on each attached Windows server.

3. In the server's drive, insert the server support CD that shipped with your storage system or your upgrade kit (for AX-Series systems upgrading to Navisphere Manager).
4. From the CD-ROM directory, navigate to the **windows > navi\_storage\_system\_initialization** folder or the **windows > AX100\_storage\_system\_initialization** folder.
5. Select the **Navisphere\_Initialization\_Wizard.exe** file or the **Install\_Navisphere\_Initialization\_Wizard.exe** file.
6. Click **Next** in the **Navisphere Storage System Initialization Wizard - Welcome** dialog box.
7. Click **Browse** to select the folder where the files should be unpacked then click **Continue**.

The Navisphere Initialization Utility **Setup.exe** file and all supporting files are unpacked to the specified folder.

8. Click **Cancel** when the InstallShield wizard opens and click **Yes** to exit the setup.
9. Open a command line window, such as a DOS window.
10. Navigate to the directory where you unpacked the Initialization Utility files (the Initialization Utility **Setup.exe** file and all supporting files). You will run the **Setup.exe** file in the next section.

---

### Creating a response file

1. Create a response file for the Initialization Utility by issuing the command below. The response file will store the setup configuration so that you can install the Initialization Utility on all attached Windows servers using one command. Since no input is required, this is referred to as a silent installation.

---

The command will launch an InstallShield Wizard. Pathnames or filenames containing spaces must be in double quotation marks, for example, "**C:\my dir\my file.cfg**".

**Setup.exe -r -f1fullpath\responsefilename**

where

**-r**

Indicates that a response file will be created.

**-f1fullpath\responsefilename**

Specifies the full path name and filename of the target response file (in this case the Initialization Utility).

2. If the response file is not already in a shared directory, move it to a shared directory so that all attached Windows servers can access the file.

---

## Performing a silent installation

1. On another attached Windows server (not the same server on which you created the response file), enter one of the commands below to install the Initialization Utility.

**Setup.exe -s -f1fullpath\responsefilename -f2fullpath\logfile**

where

**-s**

Indicates a silent installation. A silent installation requires no input after you enter the command.

**-f1fullpath\responsefilename**

Specifies the full path name of the Initialization Utility response file you created in step 1, page A-4.

**-f2fullpath\logfile**

Specifies the full path name and filename of the log file. We recommend that you create the log file on a local directory so you do not override a log file from another server's installation.

2. Verify that the installation was successful (see *Verifying the silent installation or removal* on page A-32) before running the command on all remaining attached Windows servers.
3. If the installation was successful, repeat step 1 on all remaining attached Windows servers.

## Removing the Navisphere Initialization Utility

To perform a silent removal of the Navisphere Initialization Utility all servers must be running the same revision of the utility. If you have different revisions installed on a Windows server, you cannot perform a silent removal.

---

**Important** We do not recommend that you remove the Navisphere Initialization Utility using the command line interface unless you are an advanced user.

---

To perform a silent removal for the Initialization Utility follow the procedure below.

### Creating a response file

1. Log in to the Windows server as Administrator or someone who has administrative privileges.
2. Run **regedit** and navigate to the following Initialization Utility registry key:

```
HKEY_LOCAL_MACHINE > SOFTWARE > Microsoft >
Windows > CurrentVersion > Uninstall >
{8210BD3A-00C2-11D4-9A6C-0060B0FB53A4} > UninstallString
```

3. Select and copy the text within the Initialization Utility **UninstallString**, as listed below.

```
RunDll32
C:\PROGRA~1\COMMON~1\INSTAL~1\engine\6\INTEL3~1\ctor.
dll,LaunchSetup "C:\Program Files\InstallShield
Installation
Information\{8210BD3A-00C2-11D4-9A6C-0060B0FB53A4}\se
tup.exe" -STARTEDFROMADREMOVEPROGRAMS.
```

4. Open a command line window, such as a DOS window.

5. Create a response file for the Initialization Utility by issuing the command below. The command consists of the text retrieved from the Initialization Utility registry and additional switches as shown below.

---

The command will launch an InstallShield Wizard. Pathnames or filenames containing spaces must be in double quotation marks, for example, "C:\my dir\my file.cfg".

---

*InitUtilUninstallString -r -f1fullpath\responsefilename*

where

*InitUtilUninstallString*

Is the Initialization Utility **UninstallString** text listed in step 3 on page A-6.

**-r**

Indicates that a response file will be created.

**-f1fullpath\responsefilename**

Specifies the full pathname and filename of the response file.

---

## Performing a silent removal

1. On another attached server (not the same server on which you created the response file), open a command line window.
2. Enter the command below to remove the Initialization Utility.

---

**Important** By creating the response file, a removal occurred on the server where the file was created. This is why you do not need to perform this step on that server.

---

*InitUtilUninstallString -s -f1fullpath\responsefilename  
-f2fullpath\logfile*

where

*InitUtilUninstallString*

Is the Initialization Utility **UninstallString** text listed in step 3 on page A-6.

**-s**

Indicates a silent removal. A silent removal requires no user input after you enter the command.

**-f1***fullpath\responsefilename*

Specifies the full pathname and of the response filename created in step 5 on page A-7.

**-f2***fullpath\logfile*

Specifies the full pathname and filename of the log file.

Example:

**RunDll32**

```
C:\PROGRA~1\COMMON~1\INSTAL~1\engine\6\INTEL3
~1\ctor.dll,LaunchSetup "C:\Program Files\InstallShield
Installation
Information\{8210BD3A-00C2-11D4-9A6C-0060B0FB53A4}\set
up.exe" -STARTEDFROMADDDREMOVEDPROGRAMS -s
-f1E:\aSafeDir\inittoolUninst.iss
-f2C:\aLocalSafeDir\inittoolUninst.log
```

where **-s** specifies that a silent operation will be performed, in this case a removal, using the response file recorded in **E:\aSafeDir\inittoolUninst.iss**. It will then log the result in **-f2C:\aLocalSafeDir\inittoolUninst.log**.

3. Verify that the removal was successful (refer to the next section, *Verifying the silent installation or removal*) before running the command on all the other attached Windows servers.
4. If the removal was successful, repeat steps 1 and 2 on page A-7 on all remaining attached Windows servers.

---

## Installing Navisphere Host Agent

Depending on which revision of the Host Agent is installed, follow the appropriate procedure below.

---

**Important** We do not recommend that you install the Navisphere Host Agent using the command line interface unless you are an advanced user and are experienced with using the agent configuration file. If you are not, we recommend that you install these products using the InstallShield Wizard as described in Chapter 3, *Installing and Using the Navisphere Host Agent or Server Utility*.

---

---

### Installing revision 6.7 or earlier

If you are installing Revision 6.7 or earlier of the Host Agent or CLI, you must use the InstallShield Wizard as described in Chapter 3, *Installing and Using the Navisphere Host Agent or Server Utility*.

---

### Installing revision 6.16 or later

If you are installing Revision 6.16 or later, refer to the procedure below.

---

### Preparing for the installation

1. Log in to the Windows server as Administrator or someone who has administrative privileges.
2. If the Host Agent is already installed, you must remove it, as described on page A-16 if removing Revision 6.16 or later, or page 2-5 if removing Revision 6.7 or earlier. The installation program does not let you overwrite an existing Host Agent.
3. In the server's drive, insert the server support CD that shipped with your storage system or your upgrade kit (for AX-Series systems upgrading to Navisphere Manager).
4. From the CD-ROM directory, navigate to the **windows > naviagent** folder.
5. Select the **NaviAgent.exe** file.
6. Click **Next** in the **Navisphere Agent - Welcome** dialog box.
7. Click **Browse** to select the folder where the files should be unpacked then click **Continue**.

The Navisphere Host Agent **Setup.exe** file and all supporting files are unpacked to the specified folder.

8. Click **Cancel** when the InstallShield wizard opens and click **Yes** to exit the setup.
9. Open a command line window, such as a DOS window.
10. Navigate to the directory where you unpacked the Host Agent files (the Host Agent **Setup.exe** file and all supporting files). You will run the **Setup.exe** file in the next section.

---

### Creating a response file

1. Create a response file for the Host Agent by issuing the command below. The response file will store the setup configuration so that you can install the Host Agent on all attached Windows servers using one command. Since no input is required, this is referred to as a silent installation.

---

The command will launch an InstallShield Wizard. Pathnames or filenames containing spaces must be in double quotation marks, for example, "C:\my dir\my file.cfg".

---

**Setup.exe -r -f1fullpath\responsefilename -userid userid -server servername l-cfgfile "fullpath and configuration file filename" -override**

where

**-r**

Indicates that a response file will be created.

**-f1fullpath\responsefilename**

Specifies the full pathname and filename of the target response file (in this case the Host Agent).

**-userid userid**

Specifies a privileged user's login name. The Navisphere Agent configuration file will set the privileged user as specified but leave other options with default values (see the end of this section).

You must use this switch with the **-server** switch. You cannot use this switch with the **-cfgfile** switch.

**-server** *servername*

Specifies the server for the privileged user. The Host Agent configuration file will set the privileged user as specified but leave other options with default values (see step 4 on page A-15).

You must use this switch with the **-userid** switch. You cannot use this switch with the **-cfgfile** switch.

**-cfgfile** *"fullpath and configuration file filename"*

Specifies the Host Agent configuration file to be used along with the full pathname and filename to which the Host Agent will be installed. The system then copies it to the target installation directory as **agent.config** when the installation completes.

You cannot use this switch with the **-userid** or **-server** switch.

**-override**

Specifies that if an **agent.config** file is already in the directory into which the product will be installed, it will be overridden with whatever accompanying **-userid** and **-server**, or **-cfgfile** specifies. Without this switch the **agent.config** (if it exists), will take precedence.

For example, to create a response file for Host Agent installation:

```
Setup.exe -r -f1E:\aSafeDir\agentInst.iss -userid Admin -server PrimaryServer
```

2. If the response file is not already in a shared directory, move it to a shared directory so that all attached Windows servers can access the file.

## Performing a silent installation

1. On another attached Windows server (not the same server on which you created the response file), enter one of the commands below to install the Host Agent.

- If your server has an existing configuration file and you do not want to replace it during the installation, enter:

```
Setup.exe -s -f1fullpath\responsefilename  
-f2fullpath\logfile
```

where

**-s**

Indicates a silent installation. A silent installation requires no input after you enter the command.

**-f1***fullpath\responsefilename*

Specifies the full pathname of the Host Agent response file you created in step 1 on page A-10.

**-f2***fullpath\logfile*

Specifies the full pathname and filename of the log file. We recommend that you create the log file on a local directory so you do not override a log file from another server's installation.

For example

```
Setup.exe -s -f1E:\aSafeDir\agentInst.iss  
-f2C:\aLocalSafeDir\agentInst.log
```

- If you are installing a new configuration file or overriding an existing configuration file, enter:

```
Setup.exe -userid userid -server servername | -cfgfile "fullpath  
and configuration file filename" -override -s  
-f1fullpath\responsefilename -f2fullpath\logfile
```

---

**Important** If you are creating a new configuration file or overriding an existing configuration file, you must specify at the **-userid** with the **-server** switch or the **-cfgfile** or **-override** switch.

---

where

**-userid** *userid*

Specifies a privileged user's login name. The Host Agent configuration file will set the privileged user as specified but leave other options with default values (see step 4 on page A-15).

You must use this switch with the **-server** switch. You cannot use this switch with the **-cfgfile** switch.

**-server** *servername*

Specifies the server for the privileged user. The Host Agent configuration file will set the privileged user as specified but leave other options with default values (see step 4 on page A-15).

You must use this switch with the **-userid** switch. You cannot use this switch with the **-cfgfile** switch.

**-cfgfile** "*fullpath and configuration file filename*"

Specifies the Host Agent configuration file that will be used along with the full pathname and filename to which the Host Agent will be installed. The system then copies it to the target installation directory as **agent.config** when the installation completes.

You cannot use this switch with the **-userid** or **-server** switch.

**-s**

Indicates a silent installation. A silent installation requires no input after you enter the command.

**-f1***fullpath\responsefilename*

Specifies the full pathname of the Host Agent response file you created in step 1 on page A-10.

**-f2***fullpath\logfile*

Specifies the full pathname and filename of the log file. We recommend that you create the log file on a local directory so you do not override a log file from another server's installation.

**-override**

Specifies that if an **agent.config** file is already in the directory into which the product will be installed, it will be overridden with whatever accompanying **-userid** and **-server**, or **-cfgfile** specifies. Without this switch the **agent.config** (if it exists), will take precedence.

For example:

---

If an **agent.config** file exists in the directory where the Host Agent will be installed, none of the following examples will change the **agent.config** file. The options provided with the switches will take no effect. To force the option, you must specify the **-override** switch.

---

- The example below creates a response file when specifying privileged user information.

```
Setup.exe -userid Administrator -server 10.14.123.123 -r  
-f1E:\aSafeDir\agentInst.iss
```

- The example below creates a response file while providing the Host Agent configuration file that will be used.

```
Setup.exe -cfgfile E:\aSafeDir\myAgent.config -r  
-f1E:\aSafeDir\agentInst.iss
```

- The example below installs Host Agent with the specified privileged user.

```
Setup.exe -userid Administrator -server 10.14.123.123 -s  
-f1E:\aSafeDir\agentInst.iss  
-f2C:\aLocalSafeDir\agentInst.log
```

- The example below installs Host Agent with the existing Host Agent configuration file.

```
Setup.exe -cfgfile E:\aSafeDir\myAgent.config -s  
-f1E:\aSafeDir\agentInst.iss  
-f2C:\aLocalSafeDir\agentInst.log
```

The following examples use the **-override** switch, which will force an override of an existing **agent.config** file with the values you specify with the **-userid** and **-server**, or **-cfgfile** switches.

- The example below creates a response file and overrides an existing **agent.config** file in the specified installation directory with a privileged user and other default settings (see step 4).

```
Setup.exe -userid Administrator -server 10.14.123.123  
-override -r -f1E:\aSafeDir\agentInst.iss
```

- The example below overrides an existing Agent configuration file with the **myAgent.config** file.

```
Setup.exe -cfgfile E:\aSafeDir\myAgent.config -override  
-s -f1E:\aSafeDir\agentInst.iss  
-f2C:\aLocalSafeDir\agentInst.log
```

2. Verify that the installation was successful (see *Verifying the silent installation or removal* on page A-32) before running the command on all remaining attached Windows servers.
3. If the installation was successful, repeat step 1 on all remaining attached Windows servers, then skip to step 4.

---

If you used any of the optional switches described in step 1, you should use the same switches in subsequent installations on other attached servers. However, you can use different values with the switches on the other servers.

---

4. If you specified privileged user information on the command line, the following default settings are used:
  - clarDescr
  - clarContact
  - poll 60
  - baud 9600
  - eventlog 2048

### What next?

What you do next depends on whether you will use Manager or CLI to manage the storage systems connected to the server.

**Using Manager** - If you are setting up a new server, refer to *Starting the Host Agent service* on page 3-12. If you are just upgrading the Host Agent or CLI on an existing system, you have finished the upgrade.

**Using CLI** - Refer to *Starting the Host Agent service* on page 3-12 for information on how you can monitor storage-system events.

---

## Removing the Host Agent

Depending on which revision of the Host Agent is installed, follow the appropriate procedure below.

---

**Important** We do not recommend that you remove the Navisphere Host Agent using the command line interface unless you are an advanced user and are experienced with using the agent configuration file. If you are not, we recommend that you remove these products using the InstallShield Wizard as described in *To remove the Host Agent* on page 3-10.

---

---

### Removing revision 6.7 or earlier

If you are removing Revision 6.7 or earlier of the Host Agent, you must use the InstallShield wizard as described in *To remove the Host Agent* on page 3-10.

---

### Removing revision 6.16 or later

This section describes how to remove the Host Agent for revision 6.16 or later.

---

### Creating a response file

1. Log in to the Windows server as Administrator or someone who has administrative privileges.
2. Run **regedit** and navigate to the following Host Agent registry key:

```
HKEY_LOCAL_MACHINE > SOFTWARE > Microsoft >  
Windows > CurrentVersion > Uninstall >  
{249CF790-30CE-11D4-9A87-0060B0FB53A4} > UninstallString
```

3. Select and copy the text within the Host Agent **UninstallString**, as listed below.

```
RunDll32
C:\PROGRA~1\COMMON~1\INSTAL~1\engine\6\INTEL3~1\ctor.
dll,LaunchSetup "C:\Program Files\InstallShield
Installation
Information\{249CF790-30CE-11D4-9A87-0060B0FB53A4}\
Setup.exe -STARTEDFROMADREMOVEPROGRAMS"
```

4. Open a command line window, such as a DOS window.
5. Create a response file for the Host Agent by issuing the command below. The response file will store the removal procedure so that you can remove the Host Agent on all attached Windows servers. The response file command consists of the text retrieved from the Host Agent registry key and additional switches as shown below.

The command will launch an InstallShield Wizard. If you click **yes** when asked if you want to remove the agent configuration file, every time you run the removal on a server in silent mode (**-s**) using this response file, it will remove the agent configuration file.

Pathnames or filenames containing spaces must be in double quotation marks. For example, "**C:\my dir\my file.cfg**".

```
HostAgentUninstallString -r -f1fullpath\responsefilename
```

where

```
HostAgentUninstallString
```

The Host Agent **UninstallString** text listed in step 3.

**-r**

Indicates that a response file will be created.

```
-f1fullpath\responsefilename
```

Specifies the full pathname and filename of the response file.

## Performing a silent removal

1. On another attached server (not the same server on which you created the response file), open a command line window.
2. Enter the command to uninstall the Host Agent.

---

**Important** By creating the response file, a removal occurred on the server where the file was created. This is why you do not need to perform this step on that server.

---

```
HostAgentUninstallString -s -f1fullpath\responsefilename
-f2fullpath\logfile
```

where

*HostAgentUninstallString*

Is the Host Agent **UninstallString** text listed in step 3 on page A-17.

**-s**

Indicates a silent removal. A silent removal requires no user input after you enter the command.

**-f1***full path\responsefilename*

Specifies the full pathname of the response file created in step 5 on page A-17.

**-f2***fullpath\logfile*

Specifies the full pathname and filename of the log file.

Host Agent example:

**RunDll32**

```
C:\PROGRA~1\COMMON~1\INSTAL~1\engine\6\INTEL3  
~1\ctor.dll,LaunchSetup "C:\Program Files\InstallShield  
Installation\{249CF790-30CE-11D4-9A87-0060B0FB53A4}\  
Setup.exe" -STARTEDFROMADDDREMOVEPROGRAMS -s  
-f1E:\aSafeDir\agentUninst.iss  
-f2C:\aLocalSafeDir\agentUninst.log
```

where **-s** specifies a silent operation will be performed, in this case a removal, using the response file recorded in **E:\aSafeDir\agentUninst.iss**. It will then log the result in **C:\aLocalSafeDir\agentUninst.log**.

3. Verify that the removal was successful (refer to the next section, *Verifying the silent installation or removal*) before running the command on all the other attached Windows servers.
4. If the removal was successful, repeat steps 1 and 2 on all remaining attached Windows servers.

---

## Installing the Navisphere Server Utility

We recommend that you install the Navisphere Server Utility on all attached Windows servers.

---

**Important** We do not recommend that you install Navisphere Server Utility using the command line interface unless you are an advanced user. If you are not, we recommend that you install the utility as described in *Installing the Navisphere Server Utility* on page 3-14.

---

To perform a silent installation for the Server Utility follow the procedure below.

---

### Preparing for the installation

1. Log in to the Windows server as Administrator or someone who has administrative privileges.
2. If the Server Utility is already installed, you must remove the program you are updating, as described on page A-23 (command line instructions). The installation program does not let you overwrite an existing utility.

---

**Important** To perform a silent removal, all versions of the utility must be running the same revision on each attached Windows server.

---

3. In the server's drive, insert the server support CD that shipped with your storage system or your upgrade kit (for AX-Series systems upgrading to Navisphere Manager).
4. From the CD-ROM directory, navigate to the **windows > navi\_server\_utility** folder or the **windows > AX100\_server\_utility** folder.
5. Select the **Navisphere\_Server\_Utility.exe** file or the **Install\_Navisphere\_Server\_Utility.exe** file.
6. Click **Next** in the **Navisphere Server Utility - Welcome** dialog box.

7. Click **Browse** to select the folder where the files should be unpacked then click **Continue**.  
The Navisphere Server Utility **Setup.exe** file and all supporting files are unpacked to the specified folder.
8. Click **Cancel** when the InstallShield wizard opens and click **Yes** to exit the setup.
9. Open a command line window, such as a DOS window.
10. Navigate to the directory where you unpacked the Server Utility files (the Server Utility **Setup.exe** file and all supporting files). You will run the **Setup.exe** file in the next section.

---

## Creating a response file

1. Create a response file for the Server Utility by issuing the command below. The response file will store the setup configuration so that you can install the Server Utility on all attached Windows servers using one command. Since no input is required, this is referred to as a silent installation.

---

The command will launch an InstallShield Wizard. Pathnames or filenames containing spaces must be in double quotation marks, for example, "C:\my dir\my file.cfg".

---

**Setup.exe -r -f1fullpath\responsefilename**

where

**-r**

Indicates that a response file will be created.

**-f1fullpath\responsefilename**

Specifies the full pathname and filename of the target response file (in this case the Server Utility).

2. If the response file is not already in a shared directory, move it to a shared directory so that all attached Windows servers can access the file.

---

## Performing a silent installation

1. On another attached Windows server (not the same server on which you created the response file), enter one of the commands below to install the Server Utility.

**Setup.exe -s -f1fullpath\responsefilename -f2fullpath\logfile**

where

**-s**

Indicates a silent installation. A silent installation requires no input after you enter the command.

**-f1fullpath\responsefilename**

Specifies the full pathname of the response file you created in step 1 on page A-21.

**-f2fullpath\logfile**

Specifies the full pathname and filename of the log file. We recommend that you create the log file on a local directory so you do not override a log file from another server's installation.

2. Verify that the installation was successful (see *Verifying the silent installation or removal* on page A-32) before running the command on all remaining attached Windows servers.

## Removing the Navisphere Server Utility

To perform a silent removal of the Navisphere Server Utility all servers must be running the same revision of the utility. If you have different revisions installed on a Windows server, you cannot perform a silent removal.

**Important** We do not recommend that you remove the Navisphere Server Utility using the command line interface unless you are an advanced user.

To perform a silent removal for the Server Utility follow the procedure below.

### Creating a response file

1. Log in to the Windows server as Administrator or someone who has administrative privileges.
2. Run **regedit** and navigate to the following Server Utility registry key:

```
HKEY_LOCAL_MACHINE > SOFTWARE > Microsoft >
Windows > CurrentVersion > Uninstall >
{5089BD3A-00C2-11D4-9A6C-0060B0FB53A4} > UninstallString
```

3. Select and copy the text within the Server Utility **UninstallString**, as listed below.

```
RunDll32
C:\PROGRA~1\COMMON~1\INSTAL~1\engine\6\INTEL3~1\ctor.
dll,LaunchSetup "C:\Program Files\InstallShield
Installation
Information\{5089BD3A-00C2-11D4-9A6C-0060B0FB53A4}\se
tup.exe" -STARTEDFROMADREMOVEPROGRAMS
```

4. Open a command line window, such as a DOS window.

5. Create a response file for the Server Utility by issuing the command below. The command consists of the text retrieved from the Server Utility registry and additional switches as shown below.

---

The command will launch an InstallShield Wizard. Pathname or filenames containing spaces must be in double quotation marks. For example, "C:\my dir\my file.cfg".

---

*ServerUtilUninstallString -r -f1fullpath\responsefilename*

where

*ServerUtilUninstallString*

Is the Server Utility **UninstallString** text listed in step 3 on page A-23.

**-r**

Indicates that a response file will be created.

**-f1fullpath\responsefilename**

Specifies the full pathname and filename of the response file.

---

## Performing a silent removal

1. On another attached server (not the same server on which you created the response file), open a command line window.
2. Enter the command below to remove the Server Utility.

---

**Important** By creating the response file, a removal occurred on the server where the file was created. This is why you do not need to perform this step on that server.

---

*ServerUtilUninstallString -s -f1fullpath\responsefilename  
-f2fullpath\logfile*

where

*ServerUtilUninstallString*

Is the Server Utility **UninstallString** text listed in step 3 on page A-23.

**-s**

Indicates a silent removal. A silent removal requires no user input after you enter the command.

**-f1***fullpath\responsefilename*

Specifies the full pathname of the response file created in step 5 on page A-24.

**-f2***fullpath\logfile*

Specifies the full pathname and filename of the log file.

Example:

**RunDll32**

**C:\PROGRA~1\COMMON~1\INSTAL~1\engine\6\INTEL3~1\ctor.dll,LaunchSetup "C:\Program Files\InstallShield Installation Information\{5089BD3A-00C2-11D4-9A6C-0060B0FB53A4}\setup.exe" -STARTEDFROMADREMOVEPROGRAMS -s**

**-f1E:\aSafeDir\serverutilUninst.iss**

**-f2C:\aLocalSafeDir\serverutilUninst.log**

where **-s** specifies a silent operation will be performed, in this case a removal, using the response file recorded in **E:\aSafeDir\serverutilUninst.iss**. It will then log the result in **-f2C:\aLocalSafeDir\serverutilUninst.log**.

3. Verify that the removal was successful (refer to the next section, *Verifying the silent installation or removal*) before running the command on all the other attached Windows servers.
4. If the removal was successful, repeat steps 1 and 2 on page A-24 on all remaining attached Windows servers.

---

## Installing Navisphere CLI

Depending on which revision of Navisphere CLI is installed, follow the appropriate procedure below.

---

**Important** We do not recommend that you install Navisphere CLI using the command line interface unless you are an advanced user. If you are not, we recommend that you install the utility using the InstallShield Wizard as described in Chapter 5, *Installing and Using Navisphere CLI*.

---

---

### Installing revision 6.7 or earlier

If you are installing Revision 6.7 or earlier of, you must use the InstallShield Wizard as described in Chapter 5, *Installing and Using Navisphere CLI*.

---

### Installing revision 6.16 or later

If you are installing Revision 6.16 or later, refer to the procedure below.

---

### Preparing for the installation

1. Log in to the Windows server as Administrator or someone who has administrative privileges.
2. If CLI is already installed, you must remove it, as described on page A-29 if removing Revision 6.16 or later or on page 5-4 if removing for Revision 6.7 or earlier. The installation program does not let you overwrite an existing CLI program.
3. In the server's drive, insert the server support CD that shipped with your storage system or your upgrade kit (for AX-Series systems upgrading to Navisphere Manager).
4. From the CD-ROM directory, navigate to the **windows > navicli** folder.
5. Select the **NaviCLI.exe** file.
6. Click **Next** in the **Navisphere CLI - Welcome** dialog box.

7. Click **Browse** to select the folder where the files should be unpacked then click **Continue**.  
The Navisphere CLI **Setup.exe** file and all supporting files are unpacked to the specified folder.
8. Click **Cancel** when the InstallShield wizard opens and click **Yes** to exit the setup.
9. Open a command line window, such as a DOS window.
10. Navigate to the directory where you unpacked the CLI files (the CLI **Setup.exe** file and all supporting files). You will run the **Setup.exe** file in the next section.

---

## Creating a response file

1. Create a response file for Navisphere CLI by issuing the command below. The response file will store the setup configuration so that you can install the CLI on all attached Windows servers using one command. Since this command requires no input, this is referred to as a silent installation.

---

The command will launch an InstallShield Wizard. Pathname or filenames containing spaces must be in double quotation marks, for example, "C:\my dir\my file.cfg".

---

**Setup.exe -r -f1fullpath\responsefilename**

where

**-r**

Indicates that a response file will be created.

**-f1fullpath\responsefilename**

Specifies the full pathname and filename of the target response file.

2. If the response file is not already in a shared directory, move it to a shared directory so that all attached Windows servers can access the files.

---

## Performing a silent installation

1. On another attached Windows server (not the same server on which you created the response file), enter one of the commands below to install the CLI.

**Setup.exe -s -f1fullpath\responsefilename -f2fullpath\logfile**

where

**-s**

Indicates a silent installation. A silent installation requires no input after you enter the command.

**-f1fullpath\responsefilename**

Specifies the full pathname of the CLI response file you created in step 1 on page A-27.

**-f2fullpath\logfile**

Specifies the full pathname and filename of the log file. We recommend that you create the log file on a local directory so you do not override a log file from another server's installation.

2. Verify that the installation was successful (see *Verifying the silent installation or removal* on page A-32) before running the command on all remaining attached Windows servers.

## Removing Navisphere CLI

Depending on which revision of Navisphere CLI is installed, follow the appropriate procedure below.

**Important** We do not recommend that you remove the CLI using the command line interface unless you are an advanced user. If you are not, we recommend that you remove the utility using the InstallShield Wizard as described in *To remove the CLI* on page 5-4.

### Removing revision 6.7 or earlier

If you are removing Revision 6.7 or earlier of the CLI, you must use the InstallShield wizard as described in *To remove the CLI* on page 5-4.

### Removing revision 6.16 or later

This section describes how to remove the CLI for revision 6.16 or later.

### Creating a response file

1. Log in to the Windows server as Administrator or someone who has administrative privileges.
2. Run **regedit** and navigate to the following CLI registry key:  
**HKEY\_LOCAL\_MACHINE > SOFTWARE > Microsoft > Windows > CurrentVersion > Uninstall > {2783BD3A-00C2-11D4-9A6C-0060B0FB53A4} > UninstallString**
3. Select and copy the text within the CLI **UninstallString**, as listed below.

```
RunDll32
C:\PROGRA~1\COMMON~1\INSTAL~1\engine\6\INTEL3~1\ctor.
dll,LaunchSetup "C:\Program Files\InstallShield
Installation
Information\{2783BD3A-00C2-11D4-9A6C-0060B0FB53A4}\
Setup.exe" -STARTEDFROMADDDREMOVEPROGRAMS"
```

4. Open a command line window, such as a DOS window.

5. Create a response file for the CLI by issuing the command below. The command consists of the text retrieved from the CLI registry and additional switches as shown below.

---

The command will launch an InstallShield Wizard. Pathname or filenames containing spaces must be in double quotation marks, for example, "C:\my dir\my file.cfg".

---

*CLIUninstallString -r -f1fullpath\responsefilename*

where

*CLIUninstallString*

Is the CLI **UninstallString** text listed in step 3 on page A-29.

**-r**

Indicates that a response file will be created.

**-f1***full path\responsefilename*

Specifies the full pathname and filename of the response file.

---

## Performing a silent removal

1. On another attached server (not the same server on which you created the response file), open a command line window.
2. Enter the command below to uninstall CLI.

---

**Important** By creating the response file, a removal occurred on the server where the file was created. This is why you do not need to perform this step on that server.

---

*CLIUninstallString -s -f1fullpath\responsefilename  
-f2fullpath\logfile*

where

*CLIUninstallString*

Is the CLI **UninstallString** text listed in step 3 on page A-29.

**-s**

Indicates a silent removal. A silent removal requires no user input after you enter the command.

**-f1***full path\responsefilename*

Specifies the full pathname of the response file created in step 5 on page A-30.

**-f2***fullpath\logfile*

Specifies the full pathname and filename of the log file.

Example:

**RunDll32**

```
C:\PROGRA~1\COMMON~1\INSTAL~1\engine\6\INTEL3~1\ctor.dll,LaunchSetup "C:\Program Files\InstallShield Installation Information\{249CF790-30CE-11D4-9A87-0060B0FB53A4}\Setup.exe" -STARTEDFROMADDDREMOVEDPROGRAMS -s -f1E:\aSafeDir\cliUninst.iss -f2C:\aLocalSafeDir\cliUninst.log
```

where **-s** specifies that a silent operation will be performed, in this case a removal, using the response file recorded in **E:\aSafeDir\cliUninst.iss**. It will then log the result in **C:\aLocalSafeDir\cliUninst.log**.

3. Verify that the removal was successful (refer to the next section, *Verifying the silent installation or removal*) before running the command on all the other attached Windows servers.
4. If the removal was successful, repeat steps 1 and 2 on all remaining attached Windows servers.

## Verifying the silent installation or removal

This section allows you to verify if the silent installation or removal of the Initialization Utility, Host Agent, Server Utility, and CLI were successful.

1. Check the log files InstallShield creates on each server. You specified the name and location of the log files in step 1 of the installations and step 2 of the removals.
2. In the log file, select **ResponseResult**. If a result code of **0** displays, the installation or removal was successful. If the installation or removal was *not* successful, one or more of the errors listed in Table A-1 are displayed:

Table A-1 Error Codes

Error Value	Description
1	<b>General error</b>
2	<b>Invalid mode</b>
3	<b>Required data not found in the Setup.iss file</b> - There is mismatch between response recorded in the response file and the correct operation. In case of Navisphere Agent installation you might not have specified the optional switches correctly.
4	<b>Not enough memory available</b>
5	<b>File does not exist</b> - The response file specified with the <b>-s</b> option might not exist.
6	<b>Cannot write to the response file</b>
7	<b>Unable to write to the log file</b>
8	<b>Invalid path to the InstallShield Silent response file</b>
9	<b>Not a valid list type (string or number)</b>
10	<b>Data type is invalid</b>
11	<b>Unknown error during setup</b>
12	<b>Dialog boxes are out of order</b>

Table A-1 Error Codes (continued)

Error Value	Description
51	Cannot create the specified folder
52	Cannot access the specified file or folder
53	Invalid option selected

If one or more of these errors is displayed during installation of the Host Agent with the command line interface, the file **naviagentInstall.log** may log messages related to the status of the Host Agent configuration setup.

3. If you performed an installation of the Host Agent, verify the configuration status of the Host Agent using Navisphere CLI. Navisphere CLI allows you to verify the configuration status of multiple servers from one server.
  - a. From an attached Windows server, log in as Administrator or someone with administrative privileges.
  - b. In a command line interface, such as a DOS window, navigate to where Navisphere CLI is installed (if not installed, it should be installed either via an interactive or an unattended installation as mentioned above), and issue the command:
 

```
navicli -h servername or IP address remoteconfig -getconfig
```

 where
 

```
-h servername or IP address
```

 Specifies the server name or IP address of the server on which you want to check the upgrade status.
  - c. Verify that the Host Agent configuration file has the output you expect. For example, for an installation, if you used the **-override** switch with the **-cfgfile** switch, you should see the contents of the file you specified with the **-cfgfile** switch.
  - d. Issue the following command:
 

```
navicli -help
```
  - e. Verify that the version number is correct.



---

This glossary contains terms related to disk storage systems. Many of these terms are used in this manual.

### A

- admhost** An executable program that you can run interactively via script. It runs only on Microsoft Windows Server 2003 or Windows 2000 operating systems, and works with layered-driver devices (for example, SAN Copy, SnapView and MirrorView/A devices), and non-layered-driver devices.
- admsnap** An executable program that you can run interactively or via a script to manage SnapView clones and snapshots. The Admsnap Utility resides on the servers connected to the storage system with the SnapView driver. Admsnap runs on Microsoft Windows (Windows Server 2003 and Windows 2000), AIX, HP-UX, IRIX, Linux, NetWare, and Solaris operating systems.
- Agent** See Host Agent.
- arbitration** The process of selecting one respondent from a group requesting service at the same time.

### B

- bind** In the context of disk-array storage systems, the procedure by which you assign one or more disks to one LUN number. You can bind modules as one of the following RAID types: RAID 5 (independent access array), RAID 3 (parallel access array), RAID 1 (mirrored pair),

RAID 0 (nonredundant array), RAID 1/0 (mirrored RAID 0), disk (individual disk), or hot spare. Before the LUN can store data, you must make it available to the operating system. Unbinding reverses the bind process, changing a LUN into its original disks or disk parts. Unbinding destroys all user information on the LUN. You bind (and unbind) disks using Navisphere Manager or the CLI as described in the Navisphere Manager or Agent and CLI manual.

## C

**cache** See storage-system caching.

**CLI** A command line interpreter that lets you bind disks into LUNs on a non-RAID group storage system, create RAID groups and bind LUNs on them on a RAID group storage system, unbind LUNs, destroy RAID groups, set storage system properties, and ascertain storage-system status. Navisphere CLI lets you do that for multiple storage systems on multiple servers running Navisphere Agent. For more information on Navisphere CLI, refer to the Navisphere Agent and CLI manual for AIX environments.

## D

**disk** A self-contained disk drive that slides into one slot in the front of the storage system. It consists of the carrier assembly, which holds the disk drive and the regulator board. Also called disk module.

**disk unit** A short name for LUN.

## F

**FC-AL (Fibre Channel arbitrated loop)** An arrangement of Fibre Channel stations such that messages pass from one to the next in a ring.

**FC-AL address ID** A number that identifies a device as a node on a Fibre Channel loop. You select the FC-AL address ID for an SP using switches on the back of the storage system. The default FC-AL address ID for SP A is 0; the default FC-AL address ID for SP B is 1.

**fibre** General name for physical media supported by Fibre Channel, either optical or copper.

<b>Fibre Channel</b>	A high-speed, serial, bidirectional, topology-independent, multi-protocol, highly scalable interconnection between computers, networks, and peripherals.
<b>Fibre Channel adapter (controller)</b>	The name for the printed-circuit board within the computer chassis that allows the server to access the storage system through the Fibre Channel. Also called a host bus adapter (HBA).
<b>FLARE software</b>	Microcode that controls the operation of the storage system. You can update FLARE software using Navisphere Manager.
<b>H</b>	
<b>host</b>	See server.
<b>Host Agent</b>	Software that runs on the server that is connected to the storage system and that communicates with the FLARE software on the storage system. For more information on the Navisphere Agent, refer to the Navisphere Agent and CLI manual for NetWare environments.
<b>hot repair</b>	See replace under power.
<b>hot spare</b>	A disk module bound as a global hot spare that the storage system will use automatically to replace any failed disk module in a RAID 1, RAID 1/0, RAID 3, or RAID 5 LUN.
<b>I</b>	
<b>individual (disk) unit</b>	A disk module bound as an individual unit, independent of any other disk modules in the cabinet. An individual unit has no inherent high-availability feature, but since the operating system supports software mirroring, you can make it highly available by software mirroring it with another individual unit, preferably on a different internal bus.
<b>Initialization Utility</b>	Set network parameters for CX-Series storage systems. The Initialization Utility uses a wizard as its user interface. The easy-to-use wizard guides you through the steps required to initialize your storage system.

**L**

**logical unit (LUN)** A logical unit is one or more disks or parts of disks bound into a single entity, accessible by logical unit number (LUN). Logical unit is a SCSI term. This manual generally uses the term LUN. The RAID types are: RAID 5 (independent access array), RAID 3 (parallel access array), RAID 1 (mirrored pair), RAID 0 (nonredundant array), RAID 1/0 (mirrored RAID 0), disk (individual disk), or hot spare. The operating system sees the LUN, which might include more than one disk, as one contiguous span of disk space.

**LUN** See logical unit (LUN).

**M**

**memory module** See SP memory modules.

**mirroring** Maintenance of a second (and optionally, via software, a third) copy of a logical volume image that provides continuous access if an image becomes inaccessible. The system and user applications continue running on the good image without interruption. There are two kinds of mirroring: hardware mirroring, in which the storage system maintains synchronization of the disk images, and software mirroring, in which the operating system maintains synchronization. Mirroring is further explained in the Fibre Channel configuration planning guide.

**Manager** A program with a graphical user interface that lets you bind disks into LUNs on a non-RAID group storage system, create RAID groups and bind LUNs on them on a RAID group storage system, unbind LUNs, destroy RAID groups, set storage-system properties, and ascertain storage-system status. Navisphere Manager lets you do that for multiple storage systems on multiple servers running Navisphere Agent. For more information on Navisphere Manager, refer to the Navisphere Manager manual.

**N**

**Navisphere Initialization Utility** See Initialization Utility.

**Navisphere Server Utility** See Server Utility.

**non-RAID group storage system** A storage system with SPs running a revision of FLARE software that does not support RAID groups.

## P

**path** See primary storage-system route.

**primary storage-system route or primary route**

In a storage system that has two SPs, each SP connects to each LUN through a route indicated by the device name. The primary route belongs to the SP that owns the LUN, and the secondary route belongs to the other SP. The SP on which a LUN is bound is the default owner of the unit. Knowing the routes is important because you may need to transfer control to the secondary route in the event of SP or Fibre Channel adapter failure.

## R

**RAID (redundant array of independent disks)**

A technology with its own set of definitions. See RAID 0, RAID 1, RAID 1/0, RAID 3, and RAID 5.

**RAID 0**

Three or more disk modules bound as striped disks (the storage system reads and writes file information with more than one disk at a time). RAID 0 offers enhanced performance via simultaneous I/O to different modules, but does not intrinsically offer high availability. For high availability, you can software mirror the striped disks.

**RAID 1/0**

Four, six, eight, ten, twelve, fourteen, or sixteen disk modules bound as mirrored RAID 0 group. These disk modules make up two mirror images of two, three, four, or five modules each. A RAID 1/0 group combines the speed advantage of RAID 0 with the redundancy advantage of mirroring.

**RAID 1**

Two bound disk modules that the storage-system hardware will mirror.

**RAID 3**

Five modules that use disk striping (as with RAID 5). The hardware maintains parity information that lets the group continue to run and be rebuilt after a disk-module failure. With RAID 3, I/O occurs in smaller blocks than with RAID 5, and parity information is stored on one module, not distributed among all of them. RAID 3 works well for single-task applications that use I/Os of one or more 2-Kbyte

blocks, aligned to start at disk addresses that are multiples of 2 Kbytes from the beginning of the logical disk.

**RAID 5** Three to sixteen disk modules that use disk striping, in which the hardware writes to or reads from multiple modules simultaneously, with high availability provided by parity information on each module. The ideal number of disk modules in a RAID 5 group is five.

**RAID group** A group of disks on which you bind one or more LUNs of a specific RAID type. The RAID type is that of the first LUN bound on the group. Storage systems must run a specific revision of FLARE software to support RAID groups.

**RAID group storage system** A storage system with SPs running a revision of FLARE software that supports RAID groups.

**replace under power** The storage system provides replace under power capability, allowing you to replace, for example, a disk or a fan module without powering down the storage system. Applications continue while you replace the failed module.

**route** See primary storage-system route.

## S

**secondary storage-system route or secondary route** See primary storage-system route.

**Storage Management Server** A storage system or SP that runs the Storage Management Server software.

**server** In the context of disk-array storage systems, a processor that runs an operating system and uses a disk-array storage system for data storage and retrieval.

**Server Utility** An alternative tool to using the Host Agent. Similar to the Host Agent, the Server Utility also relays configuration and status requests from Navisphere clients to CX-Series or FC-Series storage systems. However, unlike the Host Agent, the Server Utility does not push LUN mapping information back to the storage system or periodically retrieve information from the storage system.

<b>silent installation</b>	A command line interface to install the Host Agent, Navisphere Server Utility, Navisphere Storage System Initialization Utility, or Navisphere CLI on all attached Windows servers. You create a response file on one of the attached servers, which stores the setup configuration that allows you to install these applications on all remaining attached servers by using one command. This command requires no user input.
<b>silent removal</b>	A command line interface to remove the Host Agent, Navisphere Server Utility, Navisphere Storage System Initialization Utility, or Navisphere CLI on all attached Windows servers. You create a response file on one of the attached servers, which stores the setup configuration that allows you to remove these applications on all remaining attached servers by using one command. This command requires no user input.
<b>SP</b>	See storage processor (SP).
<b>SP log (of storage-system events)</b>	A time-ordered list of messages about storage-system events (such as errors) maintained by the SP. You can view this log using Navisphere Manager.
<b>SP memory modules</b>	Memory modules (SIMMs or DIMMs) that provide the local storage for an SP. An SP must have at least two 4-Mbyte memory modules to support the storage-system cache.
<b>SPS</b>	See standby power supply (SPS).
<b>standby power supply (SPS)</b>	A unit that provides backup power for a Fibre Channel storage system with SPs in case of a power outage. An SPS is required for the storage-system write caching. If power fails, the SPS allows the SP to write the cache image to the cache vault area on disk. You can replace an SPS under power, without interrupting applications.
<b>Storage group</b>	A group of LUNs on a storage system with the Access Logix option. A storage system can have multiple storage groups. A storage group can be connected to multiple servers, but a server can be connected to only one storage group in each storage system.
<b>storage processor (SP)</b>	A printed-circuit board with memory modules that control the disks in the storage-system chassis. The SP runs FLARE software that controls the operation of the storage system. For higher availability, a site can use a second SP in a storage-system chassis.

**storage-system caching** For write caching, two SPs and an SPS are required. The SP stores (caches) information temporarily in its local memory, which can save time when data is written to and/or read from a LUN. Write caching is mirrored because each SP mirrors the cached information stored by the other SP.

**striping (disk striping)** The arrangement of a LUN such that reads and writes can occur with multiple disk modules simultaneously and independently. By allowing multiple sets of read/write heads to work on the same task at once, disk striping can enhance performance. You can implement hardware disk striping by configuring disk modules as a RAID 5 group, RAID 3 group, RAID 0, or RAID 1/0 group. The size of the stripe is the stripe element size (area on each disk) multiplied by the number of data disks in the group. For RAID 5, RAID 0, RAID 1/0 groups, you can select the stripe element size. Also see RAID.

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