



SANscape[®] Software Installation Guide

Version 4.0

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Preface

This guide explains how to install SANscape®, SANscape Alert, and the SANscape Command-Line Interface (CLI).

SANscape enables you to monitor and manage your SANnet® II family product through a graphical user interface (GUI). For information about using SANscape, see the *SANscape User's Guide*.

SANscape Alert is a companion utility of SANscape that reports your storage system events to specified email addresses. For information about using SANscape Alert, refer to the *SANscape Alert User's Guide*.

The SANscape CLI enables you to perform many of the same operations as SANscape or the firmware application. For information about using the CLI, refer to the *SANscape CLI User's Guide*.

Unless otherwise specified, the SANnet II SCSI array, SANnet II FC array, SANnet II SATA array, SANnet II SATA SE array, and SANnet II Blade SCSI JBOD array are referred to as the *array* or *arrays*.

This guide is written for experienced system administrators who are already familiar with Dot Hill hardware and software products.

How This Book Is Organized

This book contains the following topics:

Chapter 1 covers information to be aware of before installing SANscape, SANscape Alert, and the SANscape CLI.

Chapter 2 provides system requirements and installation procedures for the software on systems running the Solaris™ operating system.

Chapter 3 provides system requirements and installation procedures for the software on Microsoft Windows 2000/2003 systems.

Chapter 4 provides system requirements and installation procedures for the software on systems running the Linux operating system.

Chapter 5 provides system requirements and installation procedures for the software on HP-UX systems.

Chapter 6 provides system requirements and installation procedures for the software on AIX systems.

Typographic Conventions

Typeface ¹	Meaning	Examples
AaBbCc123	The names of commands, files, and directories; onscreen computer output	Edit your <code>.login</code> file. Use <code>ls -a</code> to list all files. <code>sccli> about</code>
<i>AaBbCc123</i>	Book titles, new words or terms, words to be emphasized, command-line variables.	Read Chapter 6 in the <i>User's Guide</i> . These are called <i>class</i> options. You <i>must</i> be a superuser to do this. To delete a file, type <code>rm filename</code> .

¹ . The settings on your browser might differ from these settings.

Related Documentation

Title	Part Number
<i>SANscape Software 4.0 Installation Guide</i>	83-00003430
<i>SANscape CLI 2.0 User's Guide</i>	83-00003433
<i>SANscape 4.0 User's Guide</i>	83-00003431
<i>SANscape Alert 4.0 User's Guide</i>	83-00003432

For information related to the operating system, such as how to create a partition on a server, refer to the operating system documentation.

Technical Support

For late-breaking *Release Notes* and all manuals for this product, go to the section corresponding to your array (SANnet II SCSI array or SANnet II FC array) at:

<http://www.dothill.com/manuals>

The following information may be required when contacting Technical Support: Dot Hill serial number and part number of hardware; version of Dot Hill supplied software; host computer platform and operating system version; description of the problem and any related error messages.

Please also supply the following information to facilitate our tracking system and improve our response time: customer name, company name; state and country; telephone number with area code; Internet mail address; maintenance contract number, if applicable.

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After obtaining the above information, a support call may be placed by Internet mail, fax, or telephone.

Phone: 1-877-DOT7X24 (877-368-7924)

URL: <http://www.dothill.com/support/index.htm>

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Please include the part number (83-00003430) of your document in the subject line of your email.

CHAPTER 1

Before You Begin

This chapter contains important information you need to be aware of before you install and use SANscape software. Topics covered in this chapter include:

- “Release Notes” on page 1
- “Superuser Privileges” on page 1
- “Operating System Information” on page 1
- “Upgrading Software - Agent and Console Version Compatibility” on page 2
- “Available Optional Software” on page 2

Release Notes

Be sure to read the release notes for your array to determine whether the operating systems covered in this guide are supported by your SANnet II family product and for other supported software information.

Superuser Privileges

You must be superuser (administrator) to install the SANnet II family software. You also must be superuser to run the SANscape console.

Operating System Information

This section covers information about the operating system.

- For the SANnet II SCSI array, SANnet II FC array, SANnet II SATA array, and SANnet II SATA SE array, before you install SANscape:
 - Install operating system updates.
 - Make sure the host server that the SANscape agent is installed on is connected to a channel with a primary ID assigned. Refer to the *SANnet II Family Installation, Operation, and Service Manual* for your array for controller defaults and initial configuration information.
 - Make sure that the server is connected to the operating system and the server recognizes the storage.

- For the SANnet II SCSI array, make sure that the operating system can recognize multiple LUNs under the same ID. You might need to modify `/kernel/drv/sd.conf` for additional host LUN assignments. For information on how to modify this file, refer to the *SANnet II SCSI Array Installation, Operation, and Service Manual* for your array. If you make any changes to the `sd.conf` file, you need to reboot the workstation for the modifications to take effect.
- If your operating system contains an enterprise management console, you can configure agents to send trapped events to the console using the Simple Network Management Protocol (SNMP) service. The SNMP service is included with the operating system and is installed after installing the TCP/IP protocol stack. If you want the servers on your network to send SNMP traps to the enterprise management console, refer to the “Email and SNMP” appendix in the *SANscape User’s Guide*.

Upgrading Software - Agent and Console Version Compatibility

Because the communication protocol changes from version to version, you must install both the agent and console when upgrading. If different versions of the agent and console co-exist, SANscape is not able to discover previously configured arrays.

Available Optional Software

- To install and use SANscape Alert, a companion utility of SANscape that reports your storage system events to specified email addresses, see the *SANscape Alert User’s Guide*.
- To use multipathing, SANpath® software for the specific operating system is required. For more information, refer to the *SANpath User’s Guide* and the “SANpath and SANscape Software Integration” chapter in the *SANscape User’s Guide*.

CHAPTER 2

Installing Software on a Solaris Host

This chapter provides procedures for installing SANscape on a Solaris host. Topics covered in this chapter include:

- “System Requirements” on page 3
- “Installing the Software” on page 4
- “Users and Passwords” on page 9
- “Licensing Multiple Servers” on page 11
- “Using CLI” on page 11
- “Uninstalling the Software” on page 12
- “Restoring a Configuration” on page 14
- “Troubleshooting” on page 14

System Requirements

- Netscape™ 4.0 or later – To view online help.
- TCP/IP compliant network interface for the console – Each console must have a TCP/IP compliant network interface (such as an Ethernet or Token Ring network card, or a serial line with a modem).
- Color monitor – The console is best viewed with a monitor resolution of 1024 x 768 pixels with 256 colors.
- Operating system, memory, and disk space – The following tables list the system requirements for a Solaris host.

Table 2-1 Solaris System Requirements for SANscape Console

Solaris Version	Memory	Disk Space
Solaris 2.6 with Sun recommended patches.	256 MB required, 512 MB recommended	40 MB minimum, 100 MB recommended
Solaris 8, Solaris 9, and Solaris 10 with Sun recommended patches on SPARC platforms.		
Solaris 9 x86 Platform Edition (9 08/03) with Sun recommended patches.		

Table 2-2 Solaris System Requirements for SANscape Agent

Solaris Version	Memory	Disk Space
Solaris 2.6 with Sun recommended patches. Solaris 8, Solaris 9, and Solaris 10 with Sun recommended patches on SPARC platforms. Solaris 9 x86 Platform Edition (9 08/03) with Sun recommended patches.	128 MB minimum, 512 MB recommended	20 MB minimum, 100 MB recommended

Table 2-3 Solaris System Requirements for SANscape Alert

Solaris Version	Memory	Disk Space
Solaris 2.6 with Sun recommended patches. Solaris 8, Solaris 9, and Solaris 10 with Sun recommended patches on SPARC platforms. Solaris 9 x86 Platform Edition (9 08/03) with Sun recommended patches.	256 MB required, 512 MB recommended	40 MB minimum, 100 MB recommended

Table 2-4 Solaris System Requirements for SANscape CLI

Solaris Version	Disk Space
Solaris 2.6 with Sun recommended patches. Solaris 8, Solaris 9, and Solaris 10 with Sun recommended patches on SPARC platforms. Solaris 9 x86 Platform Edition (9 08/03) with Sun recommended patches.	20 MB minimum

Installing the Software

SANscape software comprises the following components:

- SANscape agent
- SANscape console
- SANscape Alert (optional utility)
- SANscape Command-Line Interface (CLI) (optional utility)

Note – Before installing SANscape, be sure to read the release notes for your array.

Note – You must be superuser to install SANscape and to run the console.

Upgrading Software - Agent and Console Version Compatibility

Because the communication protocol changes from version to version, you must install both the agent and console when upgrading. If different versions of the agent and console co-exist, SANscape is not able to discover previously configured arrays.

SANscape Installation Packages

The SANscape agent, SANscape console, SANscape Alert, and SANscape CLI components are included in one installation package, **SANscape**.

Install the package on each of the servers that is part of SANscape and on the computer or workstation you plan to use for managing and maintaining the storage system.

Note – Make sure that Java runtime environment software is installed on the computer or workstation on which you are installing SANscape. The earliest release of Java runtime environment software that is compatible with SANscape running on a Solaris 2.6 host is 1.3.1. Solaris 8, Solaris 9, and Solaris 10 support Java runtime environment 1.2.2 through 1.4.

Note – You must uninstall any previous version of SANscape before upgrading. For details on uninstalling SANscape, see “Uninstalling the Software” on page 12.

1. If Java runtime environment software is not installed on the computer or workstation on which you are installing SANscape, install it now.

To check the Java runtime environment software version, type:

```
# java -version
```

2. Insert the software CD or download the SANscape program from www.dothill.com/support/software.htm.
3. Change to the **solaris** directory.
4. Change to the **i386** or **sparc** directory, depending on your specific platform.

5. Install the package in one of the following ways:

a. Type:

```
# pkgadd -d ./ SANscape
```

b. Alternately, to select the package from a menu, type:

```
# pkgadd -d .
```

6. Provide appropriate responses to each of the standard installation prompts.

7. If you have previously installed SANscape, you are asked if you want to restore its configuration.

Type **y** to restore the configuration. If you type **n**, you will need to re-enable the managing servers.

```
The previous configuration was saved.  
Do you want to restore the configuration [y,n,?,q]
```

8. The installation alerts you that it will execute scripts. To continue with the installation, type **y** and press Return.

```
This package contains scripts which will be executed with  
super-user permission during the process of installing this  
package.  
Do you want to continue with the installation of <SANscape>  
[y,n,?]
```

9. The following message is displayed indicating that SANscape installed successfully.

```
Installation of SANscape agent was successful.
```

The SANscape components are installed in the following directories:

- SANscape agent: `/opt/dothill/sanscape-agent`
- SANscape console: `/opt/dothill/sanscape-console`
- SANscape Alert agent: `/opt/dothill/SANscapeAlert`
- SANscape Alert Config Tool (UI): `/opt/dothill/SANscapeAlertUI`
- SANscape CLI: `/opt/dothill/sbin`
- SANscape CLI man page: `/opt/dothill/man`

Note – User passwords are deleted when SANscape is uninstalled. If you had a previous configuration, you have to re-enter the **ssmon**, **ssadmin**, and **ssconfig** passwords as described in “Users and Passwords” on page 9.

10. The installation program checks that Java runtime 1.2.2 or later is installed. If it cannot find it, you are asked to specify the path. If you know that Java runtime environment 1.2.2, 1.3, or 1.4 has been installed but the installation program cannot find it, check the `/usr` directory to confirm that there is a link from Java to the latest version instead of Java 1.1. For instructions on creating the link, see “Troubleshooting” on page 14.

Note – Following a successful install, you will be prompted to enter the product serial number and authorization code. If this step is skipped, a single-server license will be installed. You can activate the multi-server license from the SANscape console as described in “Licensing Multiple Servers” on page 11.

11. To access SANscape online help, a web browser has to be installed on the system on which you are installing the console. If a web browser is not detected, you are asked to specify the path to the web browser (Netscape 4.0 or later).
 - a. Change to `/opt/dothill/sanscape-console` and type:

```
./config_sscon
```

- b. Type the absolute path to the web browser.

Note – You can configure the browser pathname at any time; however, if you do not specify a browser pathname at some point, you cannot access online help. To configure SANscape to use a browser that was not provided during install, or to change to a different browser, edit the file **browser.default** found in the installation directory (`/opt/dothill/sanscape-console`, by default). Replace the existing line of text with the absolute path name of the browser. If the SANscape console is running, you must exit and restart it to read the default browser information.

12. For SANnet II arrays, edit `/kernel/drv/sd.conf` if Logical Units Numbers (LUNs) other than LUN 0 are mapped from the array to the host or if third-party HBAs are used for connecting the device.

Add lines for LUNs as appropriate for your configuration. LUNs can be numbered from 0-31. Generally, do not add more LUN definitions than you actually plan to have since doing this increases the time needed to scan each SCSI bus, whether or not it has storage connected. For information on modifying the `sd.conf` file, refer to the *SANnet II 200 Installation, Operation, and Service Manual*.

13. Perform a reconfiguration reboot *only if* the `sd.conf` file has been edited.

If the `sd.conf` file has not been edited, you do not have to perform a reconfiguration reboot.
14. Start the agents as described in “To Start or Stop the Agents” on page 8.
15. Set the passwords as described in “Users and Passwords” on page 9.

To Start or Stop the Agents

The SANscape agent and SANscape Alert daemon (if installed) are not configured to start at boot time by default.

Note – To start and stop the agents you must have superuser privileges.

To start the SANscape agent and enable it to start automatically when the system boots, type:

```
# /etc/init.d/ssagent enable start
```

To start the SANscape Alert daemon and enable it to start automatically when the system boots, type:

```
# /etc/init.d/ssalertd enable start
```

To start the SANscape agent manually, type:

```
# /etc/init.d/ssagent start
```

To start the SANscape Alert agent manually, type:

```
# /etc/init.d/ssalertd start
```

If **start** is used without having used **stop** first, the script restarts any agents that have stopped. If all the agents have stopped (as with a **stop** option), the script reconfigures the runtime environment before restarting the agents.

To stop the SANscape agent, type:

```
# /etc/init.d/ssagent stop
```

To stop the SANscape Alert agent, type:

```
# /etc/init.d/ssalertd stop
```

To determine if the agents are running, type:

```
# ps -e | grep ss
```

Both **ssmon** and **ssserver** are displayed in the output if the SANscape agent is running. If the SANscape Alert agent is running, **ssalertd** is displayed. If you have enabled SNMP trap generation, you will also see the name **sstrapd**.

If the storage system is not being displayed after initial boot, stop the agent, and at the command prompt, run

```
# format
```

Label the desired disks, and then restart the agent.

Users and Passwords

The following sections explain how to create users and passwords.

Administrative (User) Security Levels and Guidelines

If you are running SANscape on a system using the Solaris operating system, *administrator security levels are automatically created during the installation process.* You only need to set passwords and assign users according to the desired permission level.

Administrative functions require access logins and passwords to prevent the possibility of one administrator reallocating or removing storage resources belonging to other clients and hosts without authorization.

You assign separate passwords for the three levels of security for SANscape. You do this by setting up three users on the agents that have storage devices that are managed by SANscape. These three users are automatically added during the installation of the agent.

The security levels must have these exact names:

- **ssmon**
Represents the monitoring level of the software.
- **ssadmin**
Represents the administration level of the software and provides access to the Rebuild, Parity Check, and Schedule Parity Check functions, as well as monitoring.
- **ssconfig**
Represents the configuration level of the software and gives the installer direct access to the configuration functions and all other related aspects of the program.

These login names are required for the three security levels. After installation, you must assign a password to each security name.

ssmon, **ssadmin**, and **ssconfig** are logins that correspond only to security levels within SANscape. For UNIX operating systems, the default shell for these accounts is assigned to **/bin/false** to prevent the user IDs from being used for interactive logins.

SANscape can be set up so that monitoring does not require users to type the **ssmon** password. This is done by selecting the **Auto Discovery** option when the servers are added to the **Managed Servers** list at the console. You can set up these three logins and passwords locally on each server. (The accounts can have different passwords on each server, if desired.)

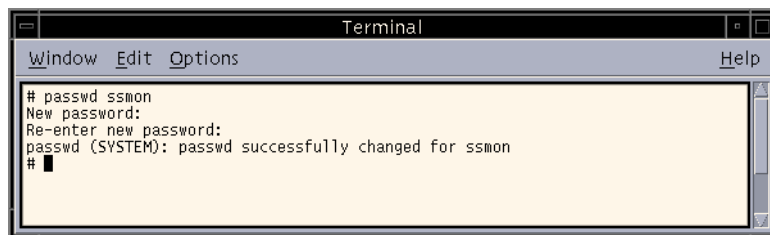
Once you have set up these three logins on the agents to be managed, the system administrator typically provides user access to SANscape by assigning employees appropriate passwords, which are based on the level of security required to complete tasks. For example, everyone who has administration privileges on a particular server is assigned the same password that was established for the user **ssadmin**.

Note – To add servers to the Managed Servers List, see “To Add Servers” in the *SANscape User’s Guide*.

To Create Passwords and Permissions

Create a password for each of the new users by typing

```
# passwd user-name
```



Administrators might also want to change group permissions, which are defined in the **svrlist.dat** file located in the **/opt/dothill/sanscape-console** directory during installation.

The console is a Java-based utility, and as such, cannot provide facilities to control permissions or ownership of files that SANscape creates. The **svrlist.dat** file is easily readable by various forms of ASCII text processors. It contains the encrypted password for the user **ssmon** and can be decrypted.

Note – Do not change the permissions and group ownership of **svrlist.dat** after adding all agents that are being monitored.

Licensing Multiple Servers

A single-server license enables you to configure, maintain, and monitor the disk storage on a single RAID system. A multi-server license enables you to expand SANscape software to perform these same operations on multiple servers.

To Activate a Multi-Server License

Note – Before you activate the multi-server license, make sure you have the multi-server **Key Code Certificate** that you received when you purchased SANscape.

1. After the console is installed and SANscape is started, go to **File** → **License Management**.
2. Enter the **Company**, **User Name**, **Serial Number**, **Authorization Code**, and click **OK**.

The **Serial Number** and **Authorization Code** appear on the **Key Code Certificate**. If the numbers are correct, SANscape is automatically upgraded to handle additional servers.

Using CLI

The command-line interface enables you to perform many of the same operations you perform by choosing menu options from the firmware application, such as downloading firmware and resetting the controller. CLI commands have the advantage of being scriptable, which is especially useful in large data center environments with many arrays that need to be configured similarly. The CLI utility communicates with the storage subsystem using in-band or out-of-band communication with the RAID controller over LVD SCSI, Fibre Channel, or Ethernet connections.

To access the CLI, log in as **root** on the server on which you installed SANscape and that is attached to the SANnet II array, and type:

```
# sccli (with options and subcommands)
```

Note – If you do not have **/usr/sbin** in your **PATH** environment variable, you can invoke the CLI as **/usr/sbin/sccli**.

Reading the CLI Man Page

To access the man page without specifying environment variables, type:

```
# man -M /opt/dothill/man sccli
```

Note – If you do not want to specify the man page directory each time, add the directory `/opt/dothill/man` to the colon-separated list of directories in the `$MANPATH` environment variable.

Uninstalling the Software

You must uninstall all components of SANscape when upgrading to a newer version of the software. Note that some files are not removed because they are created after the installation and are still valid for the upgrade environment.

With version 4.0, individual component packages have been replaced with one install package. If you have an earlier version of SANscape installed, each component must be removed separately. See “To Uninstall Earlier Versions of the Software” on page 13 for details.

Note – You must be superuser to uninstall the SANscape software.

To Uninstall SANscape Version 4.0

1. To uninstall all of the SANscape software, type the following:

```
# pkgrm SANscape
```

2. When prompted to remove the package, type **y** to confirm.

```
Do you want to remove this package? [y,n,?,q]
```


3. A message is displayed that scripts will be executed. Type **y** to continue.

```
## Removing installed package instance <SANscape>

This package contains scripts which will be executed with
super-user permission during the process of removing this
package.

Do you want to continue with the removal of this package
[y,n,?,q]
```

If the uninstall procedure is successful, the following message is displayed.

```
Removal of <SANscape> was successful.
```

To Uninstall Earlier Versions of the Software

Use the **pkgrm** command followed by the SANscape package you want to uninstall.

1. To uninstall SANscape agent, type:

```
# pkgrm HILssagt
```

2. To uninstall SANscape console, type:

```
# pkgrm HILsscon
```

3. To uninstall SANscape Alert, type:

```
# pkgrm HILAlert
# pkgrm HILAltUI
```

4. To uninstall SANscape CLI, type:

```
# pkgrm HILsccli
```

Restoring a Configuration

If you reinstall SANscape, during the installation procedure, you are given the option to restore the previous configuration. SANscape 4.0 stores the configuration information in the following file:

- `/var/opt/dothill/sanscape-agent/ssagent.cfg`

Earlier versions of SANscape store the configuration information in separate `.tar` files:

- `/var/opt/dothill/ssagt.cfg.tar`
- `/var/opt/dothill/sscon.cfg.tar`
- `/var/opt/dothill/ssalertd.cfg.tar`
- `/var/opt/dothill/ssalertui.cfg.tar`

Note – If you are removing SANscape permanently, you might want to manually remove these files; however, if you reinstall SANscape, you will not be able to restore the agent and console configurations.

Troubleshooting

When installing SANscape, running `java -version` might return a pre 1.2.2 software version even if the machine has Java runtime environment 1.2.2, 1.3, or 1.4 installed. If this happens, check that there is a link from Java runtime environment software to the latest version.

1. Check the `/usr` directory to confirm there is a link to the latest version of the Java runtime environment by typing:

```
# cd /usr
ls | grep java
```

2. If the link is not to the latest version listed, type:

```
rm java
ln -s /usr/xxx /usr/java
```

where `xxx` is the latest version of the Java runtime environment software.

CHAPTER 3

Installing Software on a Microsoft Windows Host

This chapter provides procedures for installing the SANscape software on a Windows 2000 and Windows 2003 host. Topics covered in this chapter include:

- “System Requirements” on page 15
- “Installing the Software” on page 16
- “Users and Passwords” on page 22
- “Licensing Multiple Servers” on page 23
- “Uninstalling the Software” on page 24

System Requirements

- Netscape 4.0 or later or Microsoft Internet Explorer 4.0 or later – To view online help.
- TCP/IP compliant network interface for the console – Each console must have a TCP/IP compliant network interface (such as an Ethernet or Token Ring network card, or a serial line with a modem).
- Color monitor – The console is best viewed with a monitor resolution of 1024 x 768 pixels with 256 colors.
- Operating system, memory, and disk space – The following tables list the system requirements for a Microsoft Windows host.

Table 3-1 Windows System Requirements for SANscape Console

Windows Version	Memory	Disk Space
Windows 2000 (Service Pack 3), Windows 2003	64 MB minimum, 512 MB recommended	40 MB minimum, 400 MB recommended

Table 3-2 Windows System Requirements for SANscape Agent

Windows Version	Memory	Disk Space
Windows 2000 (Service Pack 3), Windows 2003	64 MB minimum; 512 MB or more recommended. Requirement is determined by other large application programs, such as databases.	20 MB minimum, 400 MB recommended

Table 3-3 Windows System Requirements for SANscape Alert

Windows Version	Memory	Disk Space
Windows 2000 (Service Pack 3), Windows 2003	64 MB minimum, 512 MB recommended	40 MB minimum, 400 MB recommended

Table 3-4 Windows System Requirements for SANscape CLI

Windows Version	Disk Space
Windows 2000, Windows 2003	20 MB minimum

Installing the Software

SANscape software includes the following components:

- SANscape agent
- SANscape console
- SANscape Alert (optional utility)
- SANscape Command-Line Interface (CLI) (optional utility)

Note – Before installing SANscape, be sure to read the release notes for your array.

Note – You must have administrative privileges to install SANscape and to run the console.

Upgrading Software - Agent and Console Version Compatibility

Because the communication protocol changes from version to version, you must install *both* the agent and console when upgrading. If different versions of the agent and console co-exist, SANscape is not able to discover previously configured arrays.

SANscape Installation Package

The SANscape agent, SANscape console, SANscape Alert agent, SANscape Alert Config Tool (UI), and SANscape CLI are included in one installer program. The installation package, **Setup.exe**, is included on the software CD or can be downloaded from:

<http://www.dothill.com/support/software.htm>

To Install the SANscape Agent

Install the agent on each of the servers that is part of SANscape. The agent must be installed on the server to which the storage is attached.

Complete the following steps to install the agent. You must install at least one agent and one console for SANscape to run.

If you are upgrading, you must install *both* the agent and console. If different versions of the agent and console co-exist, SANscape is not able to discover previously-configured arrays.

Note – Make sure that Java runtime environment 1.2 or later is installed on the computer or workstation on which you are installing SANscape.

Note – You must uninstall SANscape when upgrading the console or agent. For details on uninstalling SANscape, see “Uninstalling the Software” on page 24.

1. To make sure that the software installation utility functions optimally, close all open Windows applications.

2. Insert the software CD or download the SANscape program from www.dothill.com/support/software.htm.
3. Browse to the **windows** directory and double-click **Setup.exe**.
4. From the **Welcome to the InstallShield Wizard for Dot Hill SANscape Software Installer** window, click **Next**.
5. From the **Select Component** window, click the **SANscape Agent** button.
6. From the **Welcome to the InstallShield Wizard for Dot Hill SANscape Agent** window, click **Next**.
7. From the **Copyright Notice** window, read the copyright notice and then click **Yes**.
8. From the **Choose Destination Location** window, click **Next**.

The agent is installed in **C:\Program Files\Dot Hill\ssagent**. To install to a different folder, click **Browse**. After the installation is complete, the agents start automatically.

9. From the **InstallShield Wizard Complete** window, click **Finish**.

To Install the SANscape Console

Install the console on the computer or workstation you plan to use for managing and maintaining the storage system. The console can be installed on the server or on any client system.

Complete the following steps to install the console. You must install at least one agent and one console for SANscape to run.

If you are upgrading, you must install *both* the agent and console. If different versions of the agent and console co-exist, SANscape is not able to discover previously-configured arrays.

Note – Make sure that Java runtime environment 1.2 or later is installed on the computer or workstation on which you are installing SANscape.

Note – You must uninstall SANscape when upgrading the console or agent. For details on uninstalling SANscape, see “Uninstalling the Software” on page 24.

1. To make sure that the software installation utility functions optimally, close all open Windows applications.
2. Insert the software CD or download the SANscape program from www.dothill.com/support/software.htm.
3. Browse to the **windows** directory and double-click **Setup.exe**.

4. From the **Welcome to the InstallShield Wizard for Dot Hill SANscape Software Installer** window, click **Next**.
5. From the **Select Component** window, click the **SANscape Console** button.
6. From the **Welcome to the InstallShield Wizard for Dot Hill SANscape Console** window, click **Next**.
7. From the **Copyright Notice** window, read the copyright notice and then click **Yes**.
8. From the **User Information** window, enter your name, the name of your company, the product serial number, the authorization code, and then click **Next**.
The product serial number and the authorization code are located on the single-server Key Code Certificate that you received when you purchased SANscape.
9. From the **Choose Destination Location** window, click **Next**.
The console is installed in **C:\Program Files\Dot Hill\SANscape Console**. To install to a different folder, click **Browse**. After the installation is complete, the agents start automatically.
10. From the **Start Copying Files** window, click **Next**.
11. From the **InstallShield Wizard Complete** window, click **Finish**.

To Install SANscape Alert

Note – You must uninstall SANscape Alert when upgrading the agent or Config Tool. For details on uninstalling SANscape Alert, see “Uninstalling the Software” on page 24.

Note – You must install the SANscape agent before installing the SANscape Alert agent and Config Tool.

Note – You must have administrative privileges to install SANscape Alert.

1. To make sure the software installation utility functions optimally, close all open Windows applications.
2. Insert the software CD or download the SANscape program from www.dothill.com/support/software.htm.
3. Browse to the **\windows** directory and double-click **Setup.exe**.
4. From the **Welcome to the InstallShield Wizard for Dot Hill SANscape Software Installer** window, click **Next**.

5. From the **Select Component** window, click the **SANscape Alert** button.
6. From the **Welcome to the InstallShield Wizard for Dot Hill SANscape Alert** window, click **Next**.
7. From the **Copyright Notice** window, read the copyright notice and then click **Yes**.
8. On the **Choose Destination Location** window, specify the location for the program files, then click **Next**.
The default folder is **C:\Program Files\Dot Hill\SANscapeAlert**. To install to a different folder, click **Browse**, select another folder, and click **Next**.
9. From the **Select Components** window, select the components that you want to install, then click **Next**.
 - **Full Installation** – installs all three software components (Service, Config Tool, and Mail Receiver Tool)
 - **Service Installation** – installs only the background Service software; note that the Service function can be configured remotely from the Config Tool
 - **Config Tool UI Installation** – installs only the Config and Mail Receiver Tools (not the Service)

Note – If you are not the administrator or you did not install the Java runtime environment, error messages are displayed that the SANscape Alert Service is not running or is failing and you are unable to complete installation.

10. After the components are installed, click **Finish** to complete the installation.

To Install SANscape CLI

The command-line interface enables you to perform many of the same operations you perform by choosing menu options from the firmware application, such as downloading firmware and resetting the controller. CLI commands have the advantage of being scriptable, which is especially useful in large data center environments with many arrays that need to be configured similarly. The CLI utility communicates with the storage subsystem using in-band or out-of-band communication with the RAID controller over LVD SCSI, Fibre Channel, or Ethernet connections.

To perform this installation, you need the CLI installation file, **Setup.exe**. This installation file must be installed on a server that is attached to the SANnet II array.

1. To make sure that the software installation utility functions optimally, close all open Windows applications.
2. Insert the software CD or download the SANscape program from www.dothill.com/support/software.htm.
3. Browse to the **windows** directory and double-click **Setup.exe**.

4. From the **Welcome to the InstallShield Wizard for Dot Hill SANscape Software Installer** window, click **Next**.
5. From the **Select Component** window, click the **SANscape CLI** button.
6. From the **Welcome to the InstallShield Wizard for Dot Hill SANscape CLI** window, click **Next**.
7. From the **Copyright Notice** window, read the copyright notice and then click **Yes**.
8. On the **Choose Destination Location** window, specify the location for the program files, then click **Next**.
The default folder is **C:\Program Files\Dot Hill\sccli**. To install to a different folder, click **Browse**, select another folder, and click **Next**.
9. From the **InstallShield Wizard Complete** window, click **Finish**.
10. To access the CLI, go to **Start → Programs → Dot Hill SANscape → SANscape CLI → Command Line Interface**.

Reading CLI Help

Go to **Start → Programs → Dot Hill SANscape → SANscape CLI → Command Line Help**.

To Start or Stop the Agents

The agents can be stopped and started manually by using the following procedures.

Note – To start the agents you must have administrative privileges.

1. On a Windows 2000 host, select **Start → Programs → Administrative Tools → Computer Management**.
On a Windows 2003 host, select **Start → Administrative Tools → Computer Management**.
Alternatively, you can right-click **My Computer** and select **Manage**.
2. Select **Services & Applications**.
3. Right-click the service (**SANscape Alert**, **SANscape Monitor**, **SANscape Server**, **SANscape Startup**) you want to start or stop.

Users and Passwords

The following sections explain how to create users and passwords.

Administrator (User) Security Levels and Guidelines

Administrative functions require access logins and passwords to prevent the possibility of one administrator reallocating or removing storage resources belonging to other clients and hosts without authorization. You assign separate passwords for the three levels of security. You do this by setting up three users on the agents that have storage devices that are managed by SANscape.

The SANscape security levels must have these exact names:

- **ssmon**

Represents the monitoring level of the software.

- **ssadmin**

Represents the administration level of the software and provides access to the Rebuild, Parity Check, and Schedule Parity Check functions, as well as monitoring.

- **ssconfig**

Represents the configuration level of the software and gives the installer direct access to the configuration functions and all other related aspects of the program.

These names are required for the three security levels. After installation, you must assign a password to each security name.

ssmon, **ssadmin**, and **ssconfig** are logins that correspond only to security levels within SANscape.

SANscape can be set up so that monitoring does not require users to enter the **ssmon** password. This is done by selecting the **Auto Discovery** option when the servers are added to the **Managed Servers** list at the SANscape console. You can set up these three logins and passwords locally on each server. (The accounts can have different passwords on each server.)

Once you have set up these three logins on the agents to be managed, the system administrator then typically provides user access to SANscape by assigning employees appropriate passwords, which are based on the level of security required to complete tasks. For example, everyone who has administration privileges on a particular server would be assigned the same password that was established for the user **ssadmin**.

Note – To add servers to the Managed Servers list, see “To Add Servers” in the *SANscape User’s Guide*.

Global Passwords on Multiple Servers

If you have a large network and do not want to set up logins individually, and it is acceptable to have the same passwords on multiple servers, you can establish the three logins on a domain server under Microsoft Windows. As a result, all other servers within the Microsoft Windows domain can access the three logins along with their respective passwords.

To Create Windows Users

1. On a Windows 2000 host, select **Start** → **Settings** → **Control Panel** → **Administrative Tools** → **Computer Management** → **System Tools** → **Local Users and Groups**.
On a Windows 2003 host, select **Start** → **Administrative Tools** → **Computer Management** → **Local Users and Groups**.
2. Right-click the **Users** folder and select **New User** to add the three users (**ssmon**, **ssconfig**, and **ssadmin**).
3. Add one of the users under **User name**. Enter a description if desired under **Description**.
4. Enter a password and if desired, select **User Cannot Change Password and Password Never Expires**.

Licensing Multiple Servers

A single-server license enables you to configure, maintain, and monitor the disk storage on a single RAID system. A multi-server license enables you to expand SANscape software to perform these same operations on multiple servers.

To Activate a Multi-Server License

Note – Before you activate the multi-server license, make sure you have the multi-server **Key Code Certificate** that you received when you purchased SANscape.

1. After the console is installed and SANscape is started, go to **File** → **License Management**.
2. Enter the **Company**, **User Name**, **Serial Number**, **Authorization Code**, and click **OK**.
The **Serial Number** and **Authorization Code** appear on the **Key Code Certificate**. If the numbers are correct, SANscape is automatically upgraded to handle multiple servers.

Uninstalling the Software

You must uninstall all components of SANscape when upgrading to a newer version of the software. Note that some files are not removed because they are created after the installation and are still valid for the upgrade environment.

Use the Windows **Add/Remove Programs** utility to remove the SANscape components from Microsoft Windows.

To Uninstall SANscape Agent

1. On a Windows 2000 host, choose **Start** → **Settings** → **Control Panel** → **Add/Remove Programs**.
On a Windows 2003 host, choose **Start** → **Control Panel** → **Add/Remove Programs**.
2. Select **Dot Hill SANscape Agent** and click **Change/Remove**. Respond appropriately to the prompts.

To Uninstall SANscape Console

1. On a Windows 2000 host, choose **Start** → **Settings** → **Control Panel** → **Add/Remove Programs**.
On a Windows 2003 host, choose **Start** → **Control Panel** → **Add/Remove Programs**.
2. Select **Dot Hill SANscape Console** and click **Change/Remove**. Respond appropriately to the prompts.

To Uninstall SANscape Alert

1. On a Windows 2000 host, choose **Start** → **Settings** → **Control Panel** → **Add/Remove Programs**.
On a Windows 2003 host, choose **Start** → **Control Panel** → **Add/Remove Programs**.
2. Select **Dot Hill SANscape Alert** and click **Change/Remove**. Respond appropriately to the prompts.

To Uninstall SANscape CLI

1. On a Windows 2000 host, choose **Start** → **Settings** → **Control Panel** → **Add/Remove Programs**.
On a Windows 2003 host, choose **Start** → **Control Panel** → **Add/Remove Programs**.
2. Select **Dot Hill SANscape CLI** and click **Change/Remove**. Respond appropriately to the prompts.

CHAPTER 4

Installing Software on a Linux Host

This chapter provides procedures for installing the SANscape software on a Red Hat Linux host. Topics covered in this chapter include:

- “System Requirements” on page 27
- “Installing the Software” on page 28
- “Users and Passwords” on page 34
- “Licensing Multiple Servers” on page 36
- “Uninstalling the Software” on page 36
- “Troubleshooting” on page 37

System Requirements

- Netscape 4.0 or later – To view online help.
- TCP/IP compliant network interface for the console – Each console must have a TCP/IP compliant network interface (such as an Ethernet or Token Ring network card, or a serial line with a modem).
- Color monitor – The console is best viewed with a monitor resolution of 1024 x 768 pixels with 256 colors.
- OS, memory, and disk space – The following tables list the system requirements for a Linux host.

Table 4-1 Linux System Requirements for SANscape Console

Linux Version	Memory	Disk Space
Red Hat Advanced Server 2.1,	256 MB minimum,	40 MB minimum,
Red Hat Advanced Server 3.0	512 MB recommended	100 MB recommended

Table 4-2 Linux System Requirements for SANscape Agent

Linux Version	Memory	Disk Space
Red Hat Advanced Server 2.1,	128 MB minimum,	20 MB minimum,
Red Hat Advanced Server 3.0	512 MB recommended	100 MB recommended

Table 4-3 Linux System Requirements for SANscape Alert

Linux Version	Memory	Disk Space
Red Hat Advanced Server 2.1,	256 MB minimum,	40 MB minimum,
Red Hat Advanced Server 3.0	512 MB recommended	100 MB recommended

Table 4-4 Linux System Requirements for SANscape CLI

Linux Version	Disk Space
Red Hat Advanced Server 2.1,	20 MB minimum
Red Hat Advanced Server 3.0	

Installing the Software

SANscape software comprises the following components:

- SANscape agent
- SANscape console
- SANscape Alert (optional utility)
- SANscape Command-Line Interface (CLI) (optional utility)

Note – Before installing SANscape, be sure to read the release notes for your array.

Note – You must be superuser to install SANscape and to run the console.

Upgrading Software - Agent and Console Version Compatibility

Because the communication protocol changes from version to version, you must install *both* the agent and console when upgrading. If different versions of the agent and console co-exist, SANscape is not able to discover previously configured arrays.

SANscape Installation Packages

The SANscape installation packages include the following files:

- **SANscapeAgent.rpm** – SANscape agent
- **SANscapeConsole.rpm** – SANscape console
- **SANscapeAlert.rpm** – SANscape Alert
- **SANscapeAlertUI.rpm** – SANscape Alert Config Tool (UI)
- **SANscapecli.rpm** – SANscape CLI

To Install the Agent and Console

Install the agent on each of the servers that is part of SANscape. Install the console on the computer or workstation you plan to use for managing and maintaining the storage system.

The console, **SANscapeConsole.rpm**, can be installed on the server or on any client system. The agent, **SANscapeAgent.rpm**, must be installed on the server to which the storage is attached.

Complete the following steps to install the agent, console, or both. You must install at least one agent and one console for SANscape to run.

If you are upgrading, you must install *both* the agent and console. If different versions of the agent and console co-exist, SANscape is not able to discover previously configured arrays.

Note – Make sure that Java runtime environment 1.2 or later is installed on the computer or workstation on which you are installing SANscape.

Note – SANscape requires the **gettext** package from the SuSE Linux Enterprise Server distribution. Make sure that **gettext** is installed on the computer or workstation on which you are installing SANscape.

Note – You must uninstall SANscape when upgrading the console or agent. For details on uninstalling SANscape, see “Uninstalling the Software” on page 36.

1. If **gettext** is not installed on the computer or workstation on which you are installing SANscape, install it now.

To check to see if **gettext** is installed, type:

```
# rpm -qa | grep gettext
```

2. If Java runtime environment software is not installed on the computer or workstation on which you are installing SANscape, install it now.

To check the Java runtime environment software version, type:

```
# java -version
```

3. Insert the software CD or download the SANscape program from www.dothill.com/support/software.htm.
4. Change to the **linux** directory.
5. Install the agent and console packages.

- a. To install the agent, type:

```
# rpm -ivh SANscapeAgent.rpm
```

- b. To install the console, type:

```
# rpm -ivh SANscapeConsole.rpm
```

Note – The installation program checks that Java runtime 1.2.2 or later is installed. If it cannot find it, you are asked to specify the path. If you know that Java runtime environment 1.2.2 or later has been installed but the installation program cannot find it, check the **/usr** directory to confirm that there is a link from Java to the latest version instead of Java 1.1. For instructions on creating the link, see “Troubleshooting” on page 37.

Note – Following a successful install, you will be prompted to enter the product serial number and authorization code. If this step is skipped, a single-server license will be installed. You can activate the multi-server license from the SANscape console as described in “Licensing Multiple Servers” on page 36.

6. To access SANscape online help, a web browser has to be installed on the system on which you are installing the console. If a web browser is not detected, you are asked to specify the path to the web browser (Netscape 4.0 or later).

- a. Change to **/opt/dothill/sanscape-console** and type:

```
./config_sscon
```

- b. Type the absolute path to the web browser.

Note – You can configure the browser pathname at any time; however, if you do not specify a browser pathname at some point, you cannot access online help.

After the agent is installed, the following message is displayed indicating the components have installed successfully and have started.

```
# rpm -ivh SANscapeAgent.rpm
Preparing...##### [100%]
1:SANscapeAgent##### [100%]
add user ssmon
add user ssadmin
add user ssconfig

Configuring and starting SANscape Agent daemons
[ OK ]
Starting SANscape Agent daemon
[ OK ]
Starting SANscape Agent monitor daemon
[ OK ]
```

After the console is installed, the following message is displayed indicating the components have installed successfully and have started.

```
# rpm -ivh SANscapeConsole.rpm
Preparing...##### [100%]
1:SANscapeConsole ##### [100%]

Installation completed successfully!
```

The SANscape Agent and Console are installed in the following directories:

- `/opt/dothill/sanscape-agent`
- `/opt/dothill/sanscape-console`

To Install SANscape Alert

Note – You must uninstall SANscape Alert when upgrading the agent or Config Tool. For details on uninstalling SANscape Alert, see “Uninstalling the Software” on page 36.

Note – You must install the SANscape agent before installing the SANscape Alert agent and Config Tool. See “To Install the Agent and Console” on page 29 for details.

Note – You must have superuser privileges to install SANscape Alert.

1. Insert the software CD or download the SANscape program from www.dothill.com/support/software.htm.
2. Change to the **linux** directory.
3. To install the SANscape Alert agent (daemon), type:

```
# rpm -ivh SANscapeAlert.rpm
```

To install the SANscape Alert Config Tool (UI), type:

```
# rpm -ivh SANscapeAlertUI.rpm
```

4. When the installation procedure is complete, the agent is started automatically.

The SANscape Alert software is installed in the following directories:

- **/opt/dothill/SANscapeAlert**
- **/opt/dothill/SANscapeAlertUI**

To Install SANscape CLI

The command-line interface enables you to perform many of the same operations you perform by choosing menu options from the firmware application, such as downloading firmware and resetting the controller. CLI commands have the advantage of being scriptable, which is especially useful in large data center environments with many arrays that need to be configured similarly. The CLI utility communicates with the storage subsystem using in-band or out-of-band communication with the RAID controller over LVD SCSI, Fibre Channel, or Ethernet connections.

The CLI installation package must be installed on a server that is attached to the array.

1. Insert the software CD or download the SANscape program from www.dothill.com/support/software.htm.
2. Change to the **linux** directory.
3. Type:

```
# rpm -ivh SANscapecli.rpm
```

4. To access the CLI, log in as **root** on the server that you installed the CLI and that is attached to the array, and type:

```
# sccli (with options and subcommands)
```

Reading the CLI Man Page

Type:

```
# man sccli
```

To Start or Stop the Agents

The SANscape agent and SANscape Alert daemon (if installed) can be stopped and started manually.

Note – To start/stop the agents (daemons), you must have superuser privileges.

To start the SANscape agent, type:

```
# /etc/init.d/ssagent start
```

or

```
# service ssagent start
```

If **start** is used without having used **stop** first, the script restarts any agents that have stopped. If all the agents have stopped (as with a **stop** option), the script reconfigures the runtime environment before restarting the agents.

To start the SANscape Alert agent, type:

```
# /etc/init.d/ssalertd start
```

To stop the SANscape agent, type:

```
# /etc/init.d/ssagent stop
```

To stop the SANscape Alert agent, type:

```
# /etc/init.d/ssalertd stop
```

To determine if the agents are running, type:

```
# ps -e | grep ss
```

Both **ssmon** and **ssserver** are displayed in the output if the SANscape agent is running. If the SANscape Alert agent is running, **ssalertd** is displayed. If you have enabled SNMP trap generation, you also see the name **sstrapd**.

Users and Passwords

The following sections explain how to create users and passwords.

Administrative (User) Security Levels and Guidelines

If you are running the SANscape application on a system using the Linux operating system, *administrator security levels are automatically created during the installation process*. You only need to set passwords and assign users according to the desired permission level.

SANscape administrative functions require access logins and passwords to prevent the possibility of one administrator reallocating or removing storage resources belonging to other clients and hosts without authorization.

You assign separate passwords for the three levels of security for SANscape. You do this by setting up three users on the agents that have storage devices that are managed by SANscape. These three users are automatically added during the installation of the agent.

The SANscape security levels must have these exact names:

- **ssmon**
Represents the monitoring level of the software.
- **ssadmin**
Represents the administration level of the software and provides access to the Rebuild, Parity Check, and Schedule Parity Check functions, as well as monitoring.
- **ssconfig**
Represents the configuration level of the software and gives the installer direct access to the configuration functions and all other related aspects of the program.

These names are required for the three security levels. After installation, you must assign a password to each security name.

ssmon, **ssadmin**, and **ssconfig** are logins that correspond only to security levels within SANscape. For UNIX operating systems, the default shell for these accounts is assigned to **/bin/false** to prevent the user IDs from being used for interactive logins.

SANscape can be set up so that monitoring does not require users to type the **ssmon** password. This is done by selecting the **Auto Discovery** option when the servers are added to the **Managed Servers** list at the console. You can set up these three logins and passwords locally on each server. (The accounts can have different passwords on each server, if desired.)

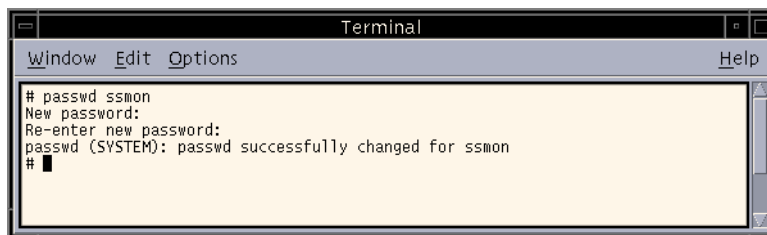
Once you have set up these three logins on the agents to be managed, the system administrator typically provides user access to SANscape by assigning employees appropriate passwords, which are based on the level of security required to complete tasks. For example, everyone who has administration privileges on a particular server is assigned the same password that was established for the user **ssadmin**.

Note – To add servers to the Managed Servers List see “To Add Servers” in the *SANscape User’s Guide*.

To Create Passwords and Permissions

Create a password for each of the new users by typing

```
# passwd user-name
```



Administrators might also want to change group permissions, which are defined in the **svrlist.dat** file located in the **/opt/dohill/SANscapeAlertUI** directory during installation.

The console is a Java-based utility, and as such, cannot provide facilities to control permissions or ownership of files that SANscape creates. The **svrlist.dat** file is easily readable by various forms of ASCII text processors. It contains the encrypted password for the user **ssmon** and can be decrypted.

Note – Do not change the permissions and group ownership of `svrlist.dat` after adding all agents that are being monitored.

Licensing Multiple Servers

A single-server license enables you to configure, maintain, and monitor the disk storage on a single RAID system. A multi-server license enables you to expand SANscape software to perform these same operations on multiple servers.

To Activate a Multi-Server License

Note – Before you activate the multi-server license, make sure you have the multi-server **Key Code Certificate** that you received when you purchased SANscape.

1. After the console is installed and SANscape is started, go to **File** → **License Management**.
2. Enter the **Company**, **User Name**, **Serial Number**, **Authorization Code**, and click **OK**.

The **Serial Number** and **Authorization Code** appear on the **Key Code Certificate**. If the numbers are correct, SANscape is automatically upgraded to handle multiple servers.

Uninstalling the Software

You must uninstall all components of SANscape when upgrading to a newer version of the software. Note that some files are not removed because they are created after the installation and are still valid for the upgrade environment.

To Uninstall SANscape

Use the `rpm -e` command followed by the SANscape package you want to uninstall, `SANscapeAgent.rpm` (agent), `SANscapeConsole.rpm` (console), `SANscapeAlert.rpm` (Alert), `SANscapeAlertUI.rpm` (Alert Config Tool), or `SANscapecli.rpm` (CLI).

```
# rpm -e SANscapeAgent
```

```
# rpm -e SANscapeConsole
```

```
# rpm -e SANscapeAlert
```

```
# rpm -e SANscapeAlertUI
```

```
# rpm -e SANscapecli
```

Troubleshooting

When installing SANscape, running `java -version` might return a pre 1.2.2 software version even if the machine has Java runtime environment 1.2.2 or higher installed. If this happens, check that there is a link from Java runtime environment software to the latest version.

1. Check the `/usr` directory to confirm there is a link to the latest version of the Java runtime environment by typing:

```
# cd /usr  
ls | grep java
```

2. If the link is not to the latest version listed, type:

```
rm java  
ln -s /usr/xxx /usr/java
```

where `xxx` is the latest version of the Java runtime environment software.

CHAPTER 5

Installing Software on an HP-UX Host

This chapter provides procedures for installing for the SANscape software on IBM AIX operating systems. Topics covered in this chapter include:

- “System Requirements” on page 39
- “Installing the Software” on page 40
- “Users and Passwords” on page 46
- “Licensing Multiple Servers” on page 47
- “Uninstalling the Software” on page 48

System Requirements

- Netscape 4.6 or later – To view online help.
- TCP/IP compliant network interface for the console – Each console must have a TCP/IP compliant network interface (such as an Ethernet or Token Ring network card, or a serial line with a modem).
- Color monitor – The console is best viewed with a monitor resolution of 1024 x 768 pixels with 256 colors.
- Operating system, memory, and disk space – The following tables list the system requirements for a HP-UX host.

Table 5-1 HP-UX System Requirements for SANscape Console

HP-UX Version	Memory	Disk Space
11.0 and 11i	256 MB minimum, 512 MB recommended	40 MB minimum, 100 MB recommended

Table 5-2 HP-UX System Requirements for SANscape Agent

HP-UX Version	Memory	Disk Space
11.0 and 11i	128 MB minimum, 512 MB recommended	20 MB minimum, 100 MB recommended

Table 5-3 HP-UX System Requirements for SANscape Alert

HP-UX Version	Memory	Disk Space
11.0 and 11i	256 MB minimum, 512 MB recommended	40 MB minimum, 100 MB recommended

Table 5-4 HP-UX System Requirements for SANscape CLI

HP-UX Version	Disk Space
11.0 and 11i	20 MB minimum

Installing the Software

SANscape software comprises the following components:

- SANscape agent
- SANscape console
- SANscape Alert (optional utility)
- SANscape Command-Line Interface (CLI) (optional utility)

Note – Before installing SANscape, be sure to read the release notes for your array.

Note – You must be superuser to install SANscape and to run the console.

Upgrading Software - Agent and Console Version Compatibility

Because the communication protocol changes from version to version, you must install *both* the agent and console when upgrading. If different versions of the agent and console co-exist, SANscape is not able to discover previously configured arrays.

SANscape Installation Packages

The SANscape installation packages include the following files:

- **SANscapeAgent.depot** – SANscape agent
- **SANscapeConsole.depot** – SANscape console
- **SANscapeAlert.depot** – SANscape Alert
- **SANscapeAlertUI.depot** – SANscape Alert Config Tool (UI)
- **SANscapecli.depot** – SANscape CLI

To Install the Agent and Console

Install the agent on each of the servers that is part of SANscape. Install the console on the computer or workstation you plan to use for managing and maintaining the storage system.

The console can be installed on the server or on any client system. The agent must be installed on the server to which the storage is attached.

Complete the following steps to install the agent, console, or both. You must install at least one agent and one console for SANscape to run.

If you are upgrading, you must install *both* the agent and console. If different versions of the agent and console co-exist, SANscape is not able to discover previously configured arrays.

Note – SANscape on HP-UX supports Java runtime environment 1.2 to 1.4. Make sure that a compatible version of Java runtime environment is installed on the computer or workstation on which you are installing SANscape.

Note – You must uninstall SANscape when upgrading the console or agent. For details on uninstalling SANscape, see “Uninstalling the Software” on page 48.

1. If Java runtime environment software is not installed on the computer or workstation on which you are installing SANscape, install it now.

To check the Java runtime environment software version, type:

```
# java -version
```

2. Insert the software CD or download the SANscape program from www.dothill.com/support/software.htm.
3. Change to the **hp-ux** directory.

Note – If you are having trouble mounting the CD or reading file names, refer to <http://www.faqs.org/faqs/hp/hpux-faq/section-87.html> for workaround information.

4. To install the SANscape agent, type:

```
# swinstall -s absolute_path/SANscapeAgent.depot \*
```

where *absolute_path* is the path to the hp-ux directory where the SANscape install packages are located.

5. To install the SANscape console, type:

```
# swinstall -s absolute_path/SANscapeConsole.depot \*
```

where *absolute_path* is the path to the hp-ux directory where the SANscape install packages are located.

6. To determine if the software was installed, type:

```
# swlist | grep SAN
```

Note – Following a successful install, you will be prompted to enter the product serial number and authorization code. If this step is skipped, a single-server license will be installed. You can activate the multi-server license from the SANscape console as described in “Licensing Multiple Servers” on page 47.

7. When the installation procedure is complete, reboot the system to activate the driver and the server daemons.
8. After rebooting the system, you will need to assign a password for each of the following users: **ssadmin**, **ssmon**, and **ssconfig**. See “To Create Passwords and Permissions” on page 47 for instructions.
On reboot, the daemon kernel will start automatically, restoring volume management to the state it was in before this process began.
9. To access SANscape online help, a web browser has to be installed on the system on which you are installing the console. If a web browser is not detected, you are asked to specify the path to the web browser.

Note – You can configure the browser pathname at any time; however, if you do not specify a browser pathname at some point, you cannot access online help.

To Install SANscape Alert

Note – You must uninstall SANscape Alert when upgrading the agent or Config Tool. For details on uninstalling SANscape Alert, see “Uninstalling the Software” on page 48.

Note – You must install the SANscape agent before installing the SANscape Alert agent and Config Tool.

Note – You must have superuser privileges to install SANscape Alert.

1. Insert the software CD or download the SANscape program from www.dothill.com/support/software.htm.
2. Change to the **hp-ux** directory.
3. To install the SANscape Alert agent (daemon), type:

```
# swinstall -s absolute_path/SANscapeAlert.depot \*
```

where *absolute_path* is the path to the hp-ux directory where the SANscape install packages are located.

To install the SANscape Alert Config Tool (UI), type:

```
# swinstall -s absolute_path/SANscapeAlertUI.depot \*
```

where *absolute_path* is the path to the hp-ux directory where the SANscape install packages are located.

4. When the installation procedure is complete, the agent is started automatically. SANscape Alert software is installed in the following directories:
 - `/opt/dothill/SANscapeAlert`
 - `/opt/dothill/SANscapeAlertUI`

To Install SANscape CLI

The command-line interface enables you to perform many of the same operations you perform by choosing menu options from the firmware application, such as downloading firmware and resetting the controller. CLI commands have the advantage of being scriptable, which is especially useful in large data center environments with many arrays that need to be configured similarly. The CLI utility communicates with the storage subsystem using in-band or out-of-band communication with the RAID controller over LVD SCSI, Fibre Channel, or Ethernet connections.

The CLI installation package must be installed on a server that is attached to the array.

1. Insert the software CD or download the SANscape program from www.dothill.com/support/software.htm.
2. Change to the **hp-ux** directory.
3. Type:

```
# swinstall -s absolute_path/SANscapecli.depot \*
```

where *absolute_path* is the path to the hp-ux directory where the SANscape install packages are located.

4. To access the CLI, log in as **root** on the server that you installed the CLI and that is attached to the array, and type:

```
# sccli (with options and subcommands)
```

Reading the CLI Man Page

Type:

```
# man sccli
```


To Start or Stop the Agents

Note – To start/stop the agents (daemons), you must have superuser privileges.

The SANscape agent and SANscape Alert daemon (if installed) can be stopped and started manually by using the following scripts.

To start the SANscape agent, type:

```
# cd /sbin/init.d/ssagent start
```

To start the SANscape Alert agent, type:

```
# /sbin/init.d/ssalertd start
```

To stop the SANscape agent, type:

```
# cd /sbin/init.d/ssagent stop
```

To stop the SANscape Alert agent, type:

```
# /sbin/init.d/ssalertd stop
```

To determine if the agents are running, type:

```
# ps -e | grep ss
```

Users and Passwords

The following sections explain how to create users and passwords.

Administrative (User) Security Levels and Guidelines

Administrative functions require access logins and passwords to prevent the possibility of one administrator reallocating or removing storage resources belonging to other clients and hosts without authorization.

You assign separate passwords for the three levels of security for SANscape. You do this by setting up three users on the agents that have storage devices that are managed by SANscape. These three users are automatically added during the installation of the agent.

The security levels must have these exact names:

- **ssmon**

Represents the monitoring level of the software.

- **ssadmin**

Represents the administration level of the software and provides access to the Rebuild, Parity Check, and Schedule Parity Check functions, as well as monitoring.

- **ssconfig**

Represents the configuration level of the software and gives the installer direct access to the configuration functions and all other related aspects of the program.

These names are required for the three security levels. After installation, you must assign a password to each security name.

ssmon, **ssadmin**, and **ssconfig** are logins that correspond only to security levels within SANscape.

SANscape can be set up so that monitoring does not require users to type the **ssmon** password. This is done by selecting the **Auto Discovery** option when the servers are added to the **Managed Servers** list at the console. You can set up these three logins and passwords locally on each server. (The accounts can have different passwords on each server, if desired.)

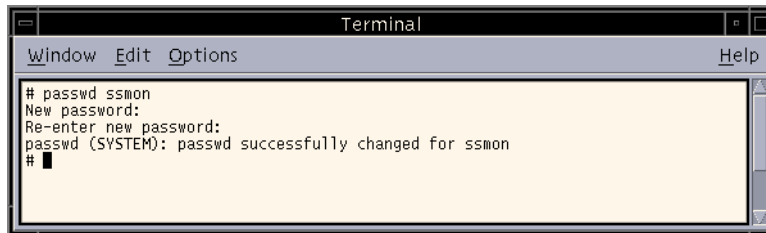
Once you have set up these three logins on the agents to be managed, the system administrator typically provides user access to SANscape by assigning employees appropriate passwords, which are based on the level of security required to complete tasks. For example, everyone who has administration privileges on a particular server is assigned the same password that was established for the user **ssadmin**.

Note – To add servers to the Managed Servers List see “To Add Servers” in the *SANscape User’s Guide*.

To Create Passwords and Permissions

Create a password for each of the new users by typing

```
# passwd user-name
```



Administrators might also want to change group permissions, which are defined in the **svrlist.dat** file located in the **/opt/dothill/sanscape-console** directory during installation.

The console is a Java-based utility, and as such, cannot provide facilities to control permissions or ownership of files that SANscape creates. The **svrlist.dat** file is easily readable by various forms of ASCII text processors. It contains the encrypted password for the user **ssmom** and can be decrypted.

Note – Do not change the permissions and group ownership of **svrlist.dat** after adding all agents that are being monitored.

Licensing Multiple Servers

A single-server license enables you to configure, maintain, and monitor the disk storage on a single RAID system. A multi-server license enables you to expand SANscape software to perform these same operations on multiple servers.

To Activate a Multi-Server License

Note – Before you activate the multi-server license, make sure you have the multi-server **Key Code Certificate** that you received when you purchased SANscape.

1. After the console is installed and SANscape is started, go to **File** → **License Management**.
2. Enter the **Company**, **User Name**, **Serial Number**, **Authorization Code**, and click **OK**.

The **Serial Number** and **Authorization Code** appear on the **Key Code Certificate**. If the numbers are correct, SANscape is automatically upgraded to handle multiple servers.

Uninstalling the Software

You must uninstall all components of SANscape when upgrading to a newer version of the software. Note that some files are not removed because they are created after the installation and are still valid for the upgrade environment.

To Uninstall SANscape

Use the `swremove` command followed by the SANscape package you want to uninstall, `SANscapeAgent.depot` (agent), `SANscapeConsole.depot` (console), `SANscapeAlert.depot` (Alert), `SANscapeAlertUI.depot` (Alert Config Tool), or `SANscapecli.depot` (CLI).

```
# swremove SANscapeAgent
```

```
# swremove SANscapeConsole
```

```
# swremove SANscapeAlert
```

```
# swremove SANscapeAlertUI
```

```
# swremove SANscapecli
```

CHAPTER 6

Installing Software on an IBM AIX Host

This chapter provides procedures for installing the SANscape software on an IBM AIX host. Topics covered in this chapter include:

- “System Requirements” on page 49
- “Installing the Software” on page 50
- “Users and Passwords” on page 55
- “Licensing Multiple Servers” on page 56
- “Uninstalling the Software” on page 57
- “Troubleshooting” on page 58

System Requirements

- Netscape 4.08 or later – To view online help.
- TCP/IP compliant network interface for the console – Each console must have a TCP/IP compliant network interface (such as an Ethernet or Token Ring network card, or a serial line with a modem).
- Color monitor – The console is best viewed with a monitor resolution of 1024 x 768 pixels with 256 colors.
- OS, memory, and disk space – The following tables list the system requirements for an IBM AIX host.

Table 6-1 AIX System Requirements for SANscape Console

AIX Version	Memory	Disk Space
5.1, 5.2, and 5.3	256 MB minimum, 512 MB recommended	40 MB minimum, 100 MB recommended

Table 6-2 AIX System Requirements for SANscape Agent

AIX Version	Memory	Disk Space
5.1, 5.2, and 5.3	128 MB minimum, 512 MB recommended	20 MB minimum, 100 MB recommended

Table 6-3 AIX System Requirements for SANscape Alert

AIX Version	Memory	Disk Space
5.1, 5.2, and 5.3	256 MB minimum, 512 MB recommended	40 MB minimum, 100 MB recommended

Table 6-4 AIX System Requirements for SANscape CLI

AIX Version	Disk Space
5.1, 5.2, and 5.3	20 MB minimum

Installing the Software

SANscape software comprises the following components:

- SANscape agent
- SANscape console
- SANscape Alert (optional utility)
- SANscape Command-Line Interface (CLI) (optional utility)

Note – Before installing SANscape, be sure to read the release notes for your array.

Note – You must be superuser to install SANscape and to run the console.

Upgrading Software - Agent and Console Version Compatibility

Because the communication protocol changes from version to version, you must install *both* the agent and console when upgrading. If different versions of the agent and console co-exist, SANscape is not able to discover previously configured arrays.

SANscape Installation Packages

The SANscape installation packages include the following files:

- **SANscapeAgent.bff** – SANscape agent
- **SANscapeConsole.bff** – SANscape console
- **SANscapeAlert.bff** – SANscape Alert
- **SANscapeAlertUI.bff** – SANscape Alert Config Tool (UI)
- **SANscapecli.bff** – SANscape CLI

To Install the Agent and Console

Install the agent on each of the servers that is part of SANscape. Install the console on the computer or workstation you plan to use for managing and maintaining the storage system.

The console can be installed on the server or on any client system. The agent must be installed on the server to which the storage is attached.

Complete the following steps to install the agent, console, or both. You must install at least one agent and one console for SANscape to run.

If you are upgrading, you must install *both* the agent and console. If different versions of the agent and console co-exist, SANscape is not able to discover previously configured arrays.

Note – SANscape on IBM AIX supports Sun Java runtime environment 1.2 to 1.5 and IBM Java runtime environment 1.2 to 1.4. Make sure that a compatible version of Java runtime environment is installed on the computer or workstation on which you are installing SANscape.

Note – You must uninstall SANscape when upgrading the console or agent. For details on uninstalling SANscape, see “Uninstalling the Software” on page 57.

1. If Java runtime environment software is not installed on the computer or workstation on which you are installing SANscape, install it now.

To check the Java runtime environment software version, type:

```
# java -version
```

2. Insert the software CD or download the SANscape program from www.dothill.com/support/software.htm.
3. Change to the **aix** directory.
4. To install the agent, type:

```
# installp -a -d SANscapeAgent.bff all
```

5. To install the console, type:

```
# installp -a -d SANscapeConsole.bff all
```

The SANscape components are installed in separate directories under **/usr/dothill** by default.

Note – If you know that a supported version of Java runtime environment has been installed but the installation program cannot find it, see “Troubleshooting” on page 58.

Note – Following a successful install, you will be prompted to enter the product serial number and authorization code. If this step is skipped, a single-server license will be installed. You can activate the multi-server license from the SANscape console as described in “Licensing Multiple Servers” on page 56.

6. When the installation procedure is complete, reboot the system to activate the driver and the server daemons.
7. After rebooting the system, you will need to assign a password for each of the following users: **ssadmin**, **ssmon**, and **ssconfig**. See “To Create Passwords and Permissions” on page 56 for instructions.
On reboot, the daemon kernel will start automatically, restoring volume management to the state it was in before this process began.
8. To access SANscape online help, a web browser has to be installed on the system on which you are installing the console. If a web browser is not detected, you are asked to specify the path to the web browser.

Note – You can configure the browser pathname at any time; however, if you do not specify a browser pathname at some point, you cannot access online help.

9. To start the console, at the command line, enter:

```
# ssconsole
```

To Install SANscape Alert

Note – You must uninstall SANscape Alert when upgrading the agent or Config Tool. For details on uninstalling SANscape Alert, see “Uninstalling the Software” on page 57.

Note – You must install the SANscape agent before installing the SANscape Alert agent and Config Tool.

Note – Make sure Java runtime environment 1.2 or higher is installed on the computer or workstation on which you are installing SANscape Alert.

Note – You must have superuser privileges to install SANscape Alert.

1. Insert the software CD or download the IBM AIX SANscape Alert program from www.dothill.com/support/software.htm.
2. Change to the **aix** directory.
3. To install the SANscape Alert agent (daemon), type:

```
# installp -a -d SANscapeAlert.bff all
```

To install the SANscape Alert Config Tool (UI), type:

```
# installp -a -d SANscapeAlertUI.bff all
```

4. When the installation procedure is complete, the agent is started automatically.

SANscape Alert software is installed in the following directories:

- **/usr/dothill/SANscapeAlert**
- **/usr/dothill/SANscapeAlertUI**

To Install SANscape CLI

The command-line interface enables you to perform many of the same operations you perform by choosing menu options from the firmware application, such as downloading firmware and resetting the controller. CLI commands have the advantage of being scriptable, which is especially useful in large data center environments with many arrays that need to be configured similarly. The CLI utility communicates with the storage subsystem using in-band or out-of-band communication with the RAID controller over LVD SCSI, Fibre Channel, or Ethernet connections.

The CLI installation package must be installed on a server that is attached to the array.

1. Insert the software CD or download the SANscape program from www.dothill.com/support/software.htm.
2. Change to the **aix** directory.
3. Type:

```
# installp -a -d SANscapecli.bff
```

4. To access the CLI, log in as **root** on the server that you installed the CLI and that is attached to the array, and type:

```
# sccli (with options and subcommands)
```

Reading the CLI Man Page

Type:

```
# man sccli
```

To Start or Stop the Agents

The SANscape agent and the SANscape Alert daemon (if installed) can be stopped and started manually.

Note – To start/stop the agents (daemons), you must have superuser privileges.

To start the SANscape agent on the server, type:

```
# /etc/ssagent start
```

To start the SANscape Alert agent, type:

```
# /usr/sbin/ssalertd start
```

To stop the SANscape agent on the server, type:

```
# /etc/ssagent stop
```

To stop the SANscape Alert agent, type:

```
# /usr/sbin/ssalertd stop
```

Users and Passwords

The following sections explain how to create users and passwords.

Administrative (User) Security Levels and Guidelines

Administrative functions require access logins and passwords to prevent the possibility of one administrator reallocating or removing storage resources belonging to other clients and hosts without authorization.

You assign separate passwords for the three levels of security for SANscape. You do this by setting up three users on the agents that have storage devices that are managed by SANscape. These three users are automatically added during the installation of the agent.

The security levels must have these exact names:

- **ssmon**

Represents the monitoring level of the software.

- **ssadmin**

Represents the administration level of the software and provides access to the Rebuild, Parity Check, and Schedule Parity Check functions, as well as monitoring.

- **ssconfig**

Represents the configuration level of the software and gives the installer direct access to the configuration functions and all other related aspects of the program.

These names are required for the three security levels. After installation, you must assign a password to each security name.

ssmon, **ssadmin**, and **ssconfig** are logins that correspond only to security levels within SANscape.

SANscape can be set up so that monitoring does not require users to type the **ssmon** password. This is done by selecting the **Auto Discovery** option when the servers are added to the **Managed Servers** list at the console. You can set up these three logins and passwords locally on each server. (The accounts can have different passwords on each server, if desired.)

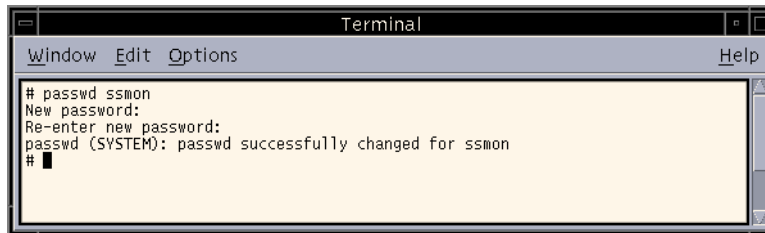
Once you have set up these three logins on the agents to be managed, the system administrator typically provides user access to SANscape by assigning employees appropriate passwords, which are based on the level of security required to complete tasks. For example, everyone who has administration privileges on a particular server is assigned the same password that was established for the user **ssadmin**.

Note – To add servers to the Managed Servers List see “To Add Servers” in the *SANscape User’s Guide*.

To Create Passwords and Permissions

Create a password for each of the new users by typing

```
# passwd user-name
```



Administrators might also want to change group permissions, which are defined in the **svrlist.dat** file located in the **/usr/dothill/SANscapeAlertUI** directory during installation.

The console is a Java-based utility, and as such, cannot provide facilities to control permissions or ownership of files that SANscape creates. The **svrlist.dat** file is easily readable by various forms of ASCII text processors. It contains the encrypted password for the user **ssmon** and can be decrypted.

Note – Do not change the permissions and group ownership of **svrlist.dat** after adding all agents that are being monitored.

Licensing Multiple Servers

A single-server license enables you to configure, maintain, and monitor the disk storage on a single RAID system. A multi-server license enables you to expand SANscape software to perform these same operations on multiple servers.

To Activate a Multi-Server License

Note – Before you activate the multi-server license, make sure you have the multi-server **Key Code Certificate** that you received when you purchased SANscape.

1. After the console is installed and SANscape is started, go to **File** → **License Management**.
2. Enter the **Company**, **User Name**, **Serial Number**, **Authorization Code**, and click **OK**.

The **Serial Number** and **Authorization Code** appear on the **Key Code Certificate**. If the numbers are correct, SANscape is automatically upgraded to handle multiple servers.

Uninstalling the Software

You must uninstall all components of SANscape when upgrading to a newer version of the software. Note that some files are not removed because they are created after the installation and are still valid for the upgrade environment.

To Uninstall SANscape

Use the `installp -u` command followed by the SANscape package you want to uninstall, `SANscapeAgent.bff` (agent), `SANscapeConsole.bff` (console), `SANscapeAlert.bff` (Alert), `SANscapeAlertUI.bff` (Alert Config Tool), or `SANscapecli.bff` (CLI).

```
# installp -u SANscapeAgent
```

```
# installp -u SANscapeConsole
```

```
# installp -u SANscapeAlert
```

```
# installp -u SANscapeAlertUI
```

```
# installp -u SANscapecli
```

Troubleshooting

Java Runtime Environment 1.4

If IBM Java runtime environment 1.4 is installed on your Linux host, the SANscape installation procedure might report that Java is not installed. This is because Java 1.4 has no `rt.jar` file in its `lib` path. If this happens, perform the following steps.

1. Change to the `java_home/lib` directory, where `java_home` is the Java runtime environment's home directory.
2. Create an empty file and call it `rt.jar`.
3. Perform the SANscape installation procedure again.
4. If you still get an error, check the Java install path as described in “Java Version Mismatch” on page 58.

Java Version Mismatch

When installing SANscape, running `java -version` might return a pre 1.2.2 software version even if the machine has Java runtime environment 1.2.2 or higher installed. If this happens, check that there is a link from Java runtime environment software to the latest version.

1. Check the `/usr` directory to confirm there is a link to the latest version of the Java runtime environment by typing:

```
# cd /usr
ls | grep java
```

2. If the link is not to the latest version listed, type:

```
rm java
ln -s /usr/xxx /usr/java
```

where `xxx` is the latest version of the Java runtime environment software.

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