



Sun StorEdge™ Enterprise Backup Software 7.0

Installation Guide

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Contents

Preface 13

1. Introduction 17

About the Sun StorEdge Enterprise Backup Software Product 17

Sun StorEdge EBS Client 18

Sun StorEdge EBS Storage Node 18

Sun StorEdge EBS Server 18

Supported Devices 19

Enabler Codes 19

2. Installing the Sun StorEdge EBS Software 21

Software Installation Roadmap 21

Installation Requirements 22

Client Software 22

System Requirements 23

Installation Recommendations 23

Storage Node 23

Server Software 24

System Requirements 24

Installation Guidelines 24

Installing the Sun StorEdge EBS Software	25
Task 1: Access the Sun StorEdge EBS Software	25
▼ To Access the Installation Files from a Local CD-ROM	26
▼ To Access the Installation Files from a Remote CD-ROM	26
Task 2: Install the Sun StorEdge EBS Software	26
Installing to a Default Location	27
▼ To Install a Sun StorEdge EBS Client	27
▼ To Install a Sun StorEdge EBS Storage Node	27
▼ To Install the Sun StorEdge EBS Server	28
Installing to a Nondefault Location	30
▼ To Install the Relocatable Sun StorEdge EBS Packages to a Nondefault Location	30
Verifying the Installation	32
Ensuring the Sun StorEdge EBS Software Starts	32
How to Start the Sun StorEdge EBS Administrator Program	33
Performing a Test Backup	33
Changing the Sun StorEdge EBS Servers with Access to a Client	35
▼ To Change Client Access	35
Uninstalling the Sun StorEdge EBS Software	36
▼ To Remove the Sun StorEdge EBS Software Packages	37
3. Updating from a Previous Sun StorEdge EBS Release	39
Introduction	39
Conversion Requirements	39
Task 1: Prepare to Update the Sun StorEdge EBS Software	40
Task 2: Update the Sun StorEdge EBS Software	40
Task 3: Enable and Register the Software	42
New Resource Database Replaces nsr.res and nsrjb.res Files	42

4. Installing Sun StorEdge EBS Software in a Sun Cluster Version 3.0 Environment	43
Cluster Concepts and Terminology	44
Cluster Terminology	44
About Clustering	44
Cluster-Aware and Cluster-Unaware Sun StorEdge EBS Servers	46
Installation Requirements	46
Software Requirements	47
Hardware Requirements	47
Configuration Options	47
System Information Requirements for a Highly Available Sun StorEdge EBS Server	48
Updating from a Previous Release of Sun StorEdge EBS Software	49
Installing Sun StorEdge EBS Software in a Cluster	52
Installing a Sun StorEdge EBS Virtual Server	52
Task 1: Install the Sun StorEdge EBS Software	52
Task 2: Define the Sun StorEdge EBS Server as Highly Available	54
Task 3: Create an Instance of the Sun StorEdge EBS Server Resource Group	55
Example: A Highly Available Sun StorEdge EBS Server	56
Task 4: Grant Access to the Highly Available Sun StorEdge EBS Server	57
Task 5: Configure the Sun StorEdge EBS Server	60
Task 6: Configure Clients under the Sun StorEdge EBS Server	60
Task 7: Create Instances of the Sun StorEdge EBS Client Resource Type	62
Example: A Highly Available Informix Database Server	63
Example: A Scalable Apache Web Server	63
Task 8: Register Licenses for the Highly Available Sun StorEdge EBS Server	64

Task 9: Authorize the Software	66
Installing Only the Sun StorEdge EBS Client Software in a Cluster	67
Task 1: Install the Sun StorEdge EBS Cluster Client Software	68
Task 2: Configure Sun StorEdge EBS Client Software as Highly Available	69
Task 3: Create Instances of the Client Resource Type	70
Example: A Highly Available Informix Database Server	70
Example: A Scalable Apache Web Server	71
Task 4: Define the List of Trusted Sun StorEdge EBS Servers	71
Task 5: Configure Clients under the Sun StorEdge EBS Server	72
Configuring an External Client to a Virtual Server	73
Defining Ownership of a Raw Partition for Virtual Clients	74
Example: A Highly Available Web Server	74
Uninstalling the Sun StorEdge EBS Software	75
Sun StorEdge EBS Cluster Script	76
5. Autochanger Installation and Configuration	79
About Autochangers	79
Vendor-Specific ASC and ASCQ Codes Supported in Sun StorEdge EBS Software	80
Autochanger Configuration and Testing	81
▼ To Configure The Autochanger	82
▼ To Test The Autochanger Connection	87
The jbconfig Command Output	88
Using the op Driver with Optical Devices	90
How to Determine Device Mapping to Drives on L180/L700 Library	91
6. Evaluating and Licensing Sun StorEdge EBS Software	93
Temporary Use With a Built-in Enabler Code	94
Temporary Use With an Evaluation Enabler Code	94

- ▼ To Enter the Evaluation Enabler Code 95
- Permanent Use With a Purchased Enabler Code, Registration, and Authorization Key 95
- ▼ To Enable and Register the Sun StorEdge EBS Software 96
- ▼ To Enter the Permanent Authorization Code 97
- Update Enablers 98
- Index 99**

Figures

FIGURE 4-1 General Cluster Configuration 45

FIGURE 4-2 Sample Cluster Configuration 48

Tables

TABLE 2-1	Default Locations and Space Requirements	25
TABLE 2-2	Sun StorEdge EBS Daemons	36
TABLE 4-1	Required Information: Highly Available Sun StorEdge EBS Server	48

Preface

The *Sun StorEdge Enterprise Backup Software 7.0 Installation Guide* provides instructions on how to install Sun StorEdge Enterprise Backup Software™ software.

After you install the Sun StorEdge Enterprise Backup Software, refer to the *Sun StorEdge Enterprise Backup Software 7.0 Administrator's Guide* and the program's online help for detailed instructions on how to configure, administer, and use the Sun StorEdge Enterprise Backup Software.

The information in this guide is intended for system administrators who are responsible for installing software and maintaining the servers and clients on a network. Operators who monitor the daily backups may also find this manual useful.

Before You Read This Book

In order to fully use the information in this document, you must have thorough knowledge of the topics discussed in these books:

- *Sun StorEdge Enterprise Backup Software 7.0 Administrator's Guide*
- *Sun StorEdge Enterprise Backup Software 7.0 Release Notes*

Using UNIX Commands

This document may not contain information on basic UNIX® commands and procedures such as shutting down the system, booting the system, and configuring devices.

See one or more of the following for this information:

- *Solaris Handbook for Sun Peripherals*
- AnswerBook2™ online documentation for the Solaris™ operating environment
- Other software documentation that you received with your system

Typographic Conventions

Typeface	Meaning	Examples
AaBbCc123	The names of commands, files, and directories; on-screen computer output	Edit your <code>.login</code> file. Use <code>ls -a</code> to list all files. % You have mail.
AaBbCc123	What you type, when contrasted with on-screen computer output	% su Password:
<i>AaBbCc123</i>	Book titles, new words or terms, words to be emphasized	Read Chapter 6 in the <i>User's Guide</i> . These are called <i>class</i> options. You <i>must</i> be superuser to do this.
	Command-line variable; replace with a real name or value	To delete a file, type <code>rm filename</code> .

Shell Prompts

Shell	Prompt
C shell	<i>machine_name%</i>
C shell superuser	<i>machine_name#</i>
Bourne shell and Korn shell	\$
Bourne shell and Korn shell superuser	#

Related Documentation

Application	Title	Part Number
Administration	<i>Solstice Backup 6.1 Administrator's Guide</i>	816-1412-10
Release Notes	<i>Solstice Backup 6.1 Release Notes</i>	816-1414-10

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Introduction

This chapter provides background information on Sun StorEdge Enterprise Backup Software software and supported devices. It includes the following sections:

- [“About the Sun StorEdge Enterprise Backup Software Product” on page 17](#)
- [“Supported Devices” on page 19](#)
- [“Enabler Codes” on page 19](#)

About the Sun StorEdge Enterprise Backup Software Product

The Sun StorEdge Enterprise Backup Software product is a suite of storage management software that provides backup, recovery, and other services to computers with a wide variety of operating systems and data types. Sun StorEdge EBS products allow the backup in a heterogeneous environment while giving the flexibility to design an efficient manageable setup.

The Sun StorEdge EBS software is distributed in a media kit of CD-ROMs that contain the software and electronic documentation for several related Sun products.

The Sun StorEdge EBS product has these major components:

- Sun StorEdge EBS client
- Sun StorEdge EBS storage node
- Sun StorEdge EBS server

Sun StorEdge EBS Client

The Sun StorEdge EBS client software provides recover and on-demand backup functionality, and it communicates with the Sun StorEdge EBS server. The Sun StorEdge EBS client software is installed on all computers that are required to be backed up to the Sun StorEdge EBS server.

Sun StorEdge EBS clients may not have to be of the same operating system as the Sun StorEdge EBS server. However, to back up clients of other operating systems, the Sun StorEdge EBS server must have a Legato NetWorker® ClientPak® enabler for that type of client. For example, in order for the Sun StorEdge EBS server to back up Sun StorEdge EBS clients on another operating system, a separate Legato NetWorker ClientPak enabler must be purchased and entered for that operating system.

Sun StorEdge EBS Storage Node

Data can be backed up directly to devices attached to either a Sun StorEdge EBS server or to a Sun StorEdge EBS storage node. A storage node controls storage devices such as tape drivers, autochangers, and silos.

Storage nodes depend on the Sun StorEdge EBS server for the following functions:

- Control over which clients use the storage node's devices for backups
- License management
- Management of the client file indexes that track each client's data
- Management of the media database that tracks the data contained on each volume

Sun StorEdge EBS storage nodes and the Sun StorEdge EBS server can use different operating systems. For example, a Sun StorEdge EBS storage node can be used on another operating system with a Sun StorEdge EBS server in a Solaris operating environment. However, the storage node's enabler on the server must be of the same edition (either Network Edition or Power Edition) as the base enabler for the Sun StorEdge EBS server.

Sun StorEdge EBS Server

The Sun StorEdge EBS server software provides control and scheduling for Sun StorEdge EBS operations. On the Sun StorEdge EBS server:

- Enter the enabler licenses for the Sun StorEdge EBS server and all the functions the Sun StorEdge EBS server controls, such as autochanger modules, additional client connections, and Legato NetWorker ClientPak licenses.
- Define the clients, devices, and media that the Sun StorEdge EBS server controls.

- Define the schedules for backups and other operations.
- Monitor the results of backups and other operations.
- Manage the client file indexes that track each client's data.
- Manage the media database that tracks the data contained on each volume.

Supported Devices

Sun StorEdge EBS software supports a variety of media types and devices, either stand-alone or in an autochanger or silo tape library. Devices can be attached to a Sun StorEdge EBS server or a designated storage node. To obtain the latest list of supported devices, refer to the Legato Compatibility Guides on the Legato web site at www.legato.com.

Note – The term autochanger refers to a variety of backup devices: autoloader, carousel, datawheel, jukebox, library, and near-line storage.

Use a nonrewinding device for Sun StorEdge EBS backups. The pathnames for these devices must follow the Berkeley Software Distribution (BSD) semantic rules, for example, `/dev/rmt/0mbn`. The “b” in the pathname satisfies the BSD semantics requirement. If a file device is used, enter it as a directory path (the same as for other device types) rather than as just a filename.

Enabler Codes

Enabler codes (licenses), which activate the functionality of Sun StorEdge EBS software and other Sun software, are sold separately. For more information, see [Chapter 6](#).

Installing the Sun StorEdge EBS Software

This chapter explains how to install Sun StorEdge EBS software on Solaris. It includes the following sections:

- [“Software Installation Roadmap” on page 21](#)
- [“Installation Requirements” on page 22](#)
- [“Installing the Sun StorEdge EBS Software” on page 25](#)
- [“Verifying the Installation” on page 32](#)
- [“Changing the Sun StorEdge EBS Servers with Access to a Client” on page 35](#)
- [“Uninstalling the Sun StorEdge EBS Software” on page 36](#)

Software Installation Roadmap

The following numbered tasks are a roadmap to follow when installing Sun StorEdge EBS software. Read the roadmap and the referenced sections before installing the software:

1. Review the requirements section and note the default directory location and the installation file space requirements. For more information, see [“Installation Requirements” on page 22](#).
2. If an earlier release of Sun StorEdge EBS software is installed, update the software. For more information, see [“Installing the Sun StorEdge EBS Software” on page 25](#).
3. Install the required Sun StorEdge EBS software. For more information, see [“Installing the Sun StorEdge EBS Software” on page 25](#).

4. Install the device drivers for the Sun StorEdge EBS server and any storage nodes. For more information, refer to the following sources:
 - [Chapter 5](#)
 - The autochanger and silo chapters in the *Sun StorEdge Enterprise Backup Software Administrator's Guide*
5. Enable and register all Sun StorEdge EBS products. For more information, see [Chapter 6](#).

Installation Requirements

The system requirements differ for each of the installation types:

- [“Client Software” on page 22](#)
- [“Storage Node” on page 23](#)
- [“Server Software” on page 24](#)



Caution – Before installing Sun StorEdge EBS software, make sure that the operating system is up-to-date with the most recent Sun StorEdge EBS patches.

Note: Sun StorEdge EBS software does not support locales (defined by the operating system) or code sets that remap characters having special meaning for filesystems. Depending on the filesystem, these special characters may include the slash (/), the backslash (\), the colon (:), or the period(.). `De_DE.646` is an example of one unsupported locale. For detailed information, refer to the *Sun StorEdge Enterprise Backup Software Administrator's Guide*.

Client Software

The following sections describe Sun StorEdge EBS client software installation requirements:

- [“System Requirements” on page 23](#)
- [“Installation Recommendations” on page 23](#)

System Requirements

The system requirements differ, depending on whether or not the clients have the same operating system as the Sun StorEdge EBS server. The Sun StorEdge EBS client software package temporarily requires 35 MB of free space on the client computer.

To install software on clients:

- Of the same operating system, use the same installation media used to install the Sun StorEdge EBS server.
- Of different operating systems, use the Sun StorEdge EBS client software for that operating system on each client computer and purchase the required Legato NetWorker ClientPak enabler code. For more information, refer to the appropriate installation guide.

Installation Recommendations

The following considerations are recommended when installing Sun StorEdge EBS client software:

- It will be useful for the *PATH* environment variable for the user root on both the Sun StorEdge EBS server and the Sun StorEdge EBS client to include the directory where the Sun StorEdge EBS executables will reside after installation. While this can be done later, it may be more convenient to edit the *PATH* variables before installation. By default, the executables reside in the */usr/bin/nsr* and the */usr/sbin/nsr* directories.
- The client software can be installed either on a remote network file system-mounted directory or a local drive.

Storage Node

To install the Sun StorEdge EBS storage node software, the following requirements must be met:

- Device driver (*SUNWebsd*) and client software (*SUNWebsc*) must be installed. For more information, see [“Changing the Sun StorEdge EBS Servers with Access to a Client” on page 35](#).
- At least one supported storage device must be attached and installed. The device can either be a stand-alone device, autochanger, or silo tape library. For a list of supported devices, refer to the Legato Compatibility Guides on the Legato web site at www.legato.com.

Server Software

This section describes Sun StorEdge EBS server installation requirements:

- “System Requirements” on page 24
- “Installation Guidelines” on page 24

System Requirements

To install Sun StorEdge EBS software on a Solaris server, make sure that:

- The system meets the space requirements listed in [TABLE 2-1 on page 25](#).
- There is a directory on the server large enough for the Sun StorEdge EBS client and server indexes and the media database (usually `/nsr`). The installation script checks for space and suggests one or more locations for the indexes and media database.
- The system pathname of at least one storage device for use by the Sun StorEdge EBS server to back up and recover files.

If a tape device is being used to back up data, use a valid pathname for that device. For example:

```
/dev/rmt/0cbn
```

Note: The tape device must be nonrewinding.

- Install Acrobat Reader to read the documentation PDFs. Acrobat Reader requires a directory with enough space to install the software.

Installation Guidelines

On the Sun StorEdge EBS server, install all of the Sun StorEdge EBS software: client, storage node, server, and device drivers. It is recommended that the Sun StorEdge EBS software packages all be installed on the server during the same installation session. Note that the server doesn't require storage node software if it is not going to be a storage node, and the drivers are not required if an autochanger is not going to be attached to the server. However, installing all of the software avoids the need to reinstall if plans for the server change.

TABLE 2-1 lists the default locations on the server used by the installation script, and the disk space required.

TABLE 2-1 Default Locations and Space Requirements

Software/Documentation Files	Sun StorEdge EBS Server Default Location	Space Needed
Sun StorEdge EBS Administrator program files	/usr/bin/nsr	13 MB
Sun StorEdge EBS daemon and utility command files (if you install LGTOlicm, add one MB)	/usr/sbin/nsr	90 MB
Online client file indexes; media database	/nsr	varies
Sun StorEdge EBS device drivers (note that 39 MB of drivers are now installed in /usr/sbin/nsr)	/usr/kernel/drv /usr/kernel/drv/sparcv9 /usr/lib/nsr	1 MB
Sun StorEdge EBS man pages	/usr/share/man	1 MB
Adobe Acrobat Reader	/opt/Adobe3/bin	8 MB
Documentation PDFs	optional	varies

Installing the Sun StorEdge EBS Software

The following sections explain how to access and install the Sun StorEdge EBS software:

- [“Task 1: Access the Sun StorEdge EBS Software” on page 25](#)
- [“Task 2: Install the Sun StorEdge EBS Software” on page 26](#)

Task 1: Access the Sun StorEdge EBS Software

Access the Sun StorEdge Enterprise Backup Software software:

- [“To Access the Installation Files from a Local CD-ROM” on page 26](#)
- [“To Access the Installation Files from a Remote CD-ROM” on page 26](#)

After installation, the list of trusted Sun StorEdge EBS servers that require access to the client's data can be changed by editing the `/nsr/res/servers` file. For detailed instructions on how to change the Sun StorEdge EBS servers that are authorized to access the client, see [“Changing the Sun StorEdge EBS Servers with Access to a Client” on page 35](#).

▼ To Access the Installation Files from a Local CD-ROM

1. Log in as root to the system where the Sun StorEdge EBS software is being installed.
2. Mount the CD drive.
3. Locate the appropriate directory on the CD.

▼ To Access the Installation Files from a Remote CD-ROM

1. On the remote system:
 - a. Insert the CD into the remote system's drive.
 - b. Mount the CD drive on the remote system.
 - c. Make the CD drive exportable through the network filesystem (NFS).
2. On the local system:
 - a. Log in as root on the system where the Sun StorEdge EBS software is being installed.
 - b. Create a mount point.
 - c. Mount the remote CD-ROM filesystem. For example:

```
# mount remote_host:/cdrom/mount_dir
```

Task 2: Install the Sun StorEdge EBS Software

By default, the Sun StorEdge EBS software is installed in the `/usr` directory. The software can be installed in a default or nondefault location. For instructions, see:

- [“Installing to a Default Location” on page 27](#)
- [“Installing to a Nondefault Location” on page 30](#)

Installing to a Default Location

This section explains how to install the server, client, and storage node software:

- [“To Install a Sun StorEdge EBS Client” on page 27](#)
- [“To Install a Sun StorEdge EBS Storage Node” on page 27](#)
- [“To Install the Sun StorEdge EBS Server” on page 28](#)

▼ To Install a Sun StorEdge EBS Client

To install Sun StorEdge EBS software on the computer that is designated as the Sun StorEdge EBS client:

1. Enter the **pkgadd** command, as follows:

```
# pkgadd -d /cdrom/cdrom0/solaris/sparc
```



Caution – Do *not* press the [Enter] key for the default response *All*. Accepting the default installs the server, the device driver packages, and the Fobre Channel devices.

2. Enter the appropriate option number to install the client package (*SUNWebsc*). The client package temporarily requires 35 MB of free space on the client computer.
3. (Optional) Enter the appropriate options number to install the man pages, (*SUNWebsm*).
4. Start the Sun StorEdge EBS daemons.
5. When all the applicable packages have been added and the prompt appears, press [q] to exit.

Note – After installation, the list of trusted Sun StorEdge EBS servers that require access to the client’s data can be changed by editing the `/nsr/res/servers` file. For detailed instructions on how to change the Sun StorEdge EBS servers that are authorized to access the client, see [“Changing the Sun StorEdge EBS Servers with Access to a Client” on page 35](#).

▼ To Install a Sun StorEdge EBS Storage Node

To install Sun StorEdge EBS software on the computer that is designated as the Sun StorEdge EBS storage node and for which you have purchased an enabler code:

1. Enter the `pkgadd` command as follows:

```
# pkgadd -d /cdrom/cdrom0/solaris/sparc
```



Caution – Start the Sun StorEdge EBS daemons *only* after the last Sun StorEdge EBS package is installed.

2. Enter the appropriate option to install the following packages. Software packages on the storage node must be installed in the following order:
 - *SUNWebsc* (client software package)
 - *SUNWebsd* (device driver software package)
 - *SUNWebsn* (storage node software package)
 - *SUNWebsm* (optional man pages)
3. Start the Sun StorEdge EBS daemons.
4. When all the applicable packages have been added and the prompt appears, press [q] to exit.
5. Configure the driver software to provide support for Sun StorEdge EBS software to back up data to the SCSI storage devices attached to the system. For more information, see [“Autochanger Configuration and Testing” on page 81](#).

For the latest information about supported devices, refer to the Legato Compatibility Guides on the Legato web site at www.legato.com.

After installation, the list of trusted Sun StorEdge EBS servers that require access to the client’s data can be changed by editing the `/nsr/res/servers` file. For detailed instructions on how to change the Sun StorEdge EBS servers that are authorized to access the client, see [“Changing the Sun StorEdge EBS Servers with Access to a Client” on page 35](#).

▼ To Install the Sun StorEdge EBS Server

To install Sun StorEdge EBS software on the computer that is designated as the Sun StorEdge EBS server:

1. Keep a copy of the current configuration. The Sun StorEdge EBS software installation script modifies the `/etc/rpc` and `/etc/syslog.conf` files during the installation process.

Enter the following commands:

```
# cp /etc/rpc /etc/rpc.old
# cp /etc/syslog.conf /etc/syslog.conf.old
```

2. Enter the **pkgadd** command as follows:

```
# pkgadd -d /cdrom/cdrom0/solaris/sparc
```

3. Press [Enter] to install all of the packages on the server. Sun recommends that all of the Sun StorEdge EBS software be installed on the server at the same time.



Caution – It is recommended that the Sun StorEdge EBS daemons are started *only* after the last Sun StorEdge EBS package is installed.

To install only selected software packages on the server, install them in the following order:

- *SUNWebsc* (client software package)
- *SUNWebsd* (device drivers package)
- *SUNWebsn* (storage node software package)
- *SUNWebss* (server software package)
- *SUNWebsm* (optional man pages)

4. Start the Sun StorEdge EBS daemons.

5. When all the applicable packages are added and the prompt appears, press [q] to exit.

6. Verify that the Sun StorEdge EBS daemons shown in [TABLE 2-2](#) are running. Enter the following command:

```
# ps -ef | grep nsr
```

7. If the output does not list `nsrd` and `nsrexecd` as current processes, run the following command to start the Sun StorEdge EBS daemons on the Sun StorEdge EBS server:

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

Note: After installation, the list of trusted Sun StorEdge EBS servers that require access to the client's data can be changed by editing the `/nsr/res/servers` file. For detailed instructions on how to change the Sun StorEdge EBS servers that are authorized to access the client, see [“Changing the Sun StorEdge EBS Servers with Access to a Client” on page 35](#).

Installing to a Nondefault Location

By default, Sun StorEdge EBS software is installed in the `/usr` directory. If there is insufficient disk space on the `/usr` partition, the Sun StorEdge EBS packages can be relocated to a specified directory on another partition:

- *SUNWebsc* (client software package)
- *SUNWebsn* (storage node software package)
- *SUNWebss* (server software package)

The following Sun StorEdge EBS packages are always installed in the default location:

- *SUNWebsm* (optional Sun StorEdge EBS man pages)
- *SUNWebsd* (optional Sun StorEdge EBS device driver commands, libraries, and utilities)

For a listing of the default locations and size requirements, see [TABLE 2-1 on page 25](#).



Caution – Do not relocate any of the packages if Legato NetWorker Module software is also installed on the computer.

▼ To Install the Relocatable Sun StorEdge EBS Packages to a Nondefault Location

1. Copy the `/var/sadm/install/admin/default` file, as shown:

```
# cp /var/sadm/install/admin/default /tmp/default.tmp
```

2. Edit the `/var/sadm/install/admin/default` file and change the value assigned to the `basedir` variable from **default** to **ask**, as shown:

```
basedir=ask
```



Caution – To successfully install the *SUNWebsd* package, provide the root directory (`/`) when queried for a directory in which to install the device drivers.

3. Create a directory and the `/bin/nsr` and `/sbin/nsr` subdirectories to install the Sun StorEdge EBS packages, for example:

```
# mkdir -p /my_path/sbin/nsr
# mkdir -p /my_path/bin/nsr
```

4. Modify the root `PATH` variable to include the `/bin` and `/sbin` subdirectories of the directory just created, for example:

```
/my_path/bin/nsr:/my_path/sbin/nsr
```

5. Enter the **pkgadd** command:

```
# pkgadd -d /cdrom/cdrom0/solaris/sparc
```

6. When the following prompt appears in the script, enter the same base directory for all the relocated packages:

```
Enter path to package base directory (default: /usr) [?,q]
/my_path

Using /my_path as the package base directory.
```

7. When all the applicable packages are added and the prompt appears, press [q] to exit.

8. Copy the `/tmp/default.tmp` file to the following location. For example:

```
# cp /tmp/default.tmp /var/sadm/install/admin/default
```

If `pkgrm` is used to remove the packages at a later date, specify the base directory.

Note – After installation, the list of trusted Sun StorEdge EBS servers that require access to the client’s data can be changed by editing the `/nsr/res/servers` file. For detailed instructions on how to change the Sun StorEdge EBS servers that are authorized to access the client, see [“Changing the Sun StorEdge EBS Servers with Access to a Client” on page 35](#).

Verifying the Installation

The following sections provide information about verifying the installation:

- [“Ensuring the Sun StorEdge EBS Software Starts” on page 32](#)
- [“Performing a Test Backup” on page 33](#)

Ensuring the Sun StorEdge EBS Software Starts

The Sun StorEdge EBS software provides the Sun StorEdge EBS Administrator program (`nwadmin`) and a command line interface. Use the Sun StorEdge EBS Administrator program for the following procedures. To learn more about the command line interface, refer to the `nsradmin(8)` man page.

The toolbar buttons in the main window of the Sun StorEdge EBS Administrator program provide quick access to the most frequently performed Sun StorEdge EBS administration tasks.

The program’s Online Help is available through the Help menu.

How to Start the Sun StorEdge EBS Administrator Program

To start the Sun StorEdge EBS Administrator program, enter **the following command**:

```
# nwadmin -s server_name &
```

If the Sun StorEdge EBS Administrator program does not appear, try one of the following:

- Check that the `DISPLAY` environment variable is set correctly.
- Check that the `PATH` environment variable contains the correct path to the Sun StorEdge EBS programs. The default installation directories for the Solaris platform are:

```
/usr/bin/nsr
```

```
/usr/sbin/nsr
```

If the Sun StorEdge EBS Administrator program cannot connect to the specified server:

1. Run the `ps` command to check that the required Sun StorEdge EBS daemons, `nsrd` and `nsrexecd`, are present on the Sun StorEdge EBS server:

```
# ps -ef | grep nsr
```

2. If the output does not list `nsrd` and `nsrexecd` as current processes, run the following command to start the Sun StorEdge EBS daemons on the Sun StorEdge EBS server:

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

Performing a Test Backup

To perform a test backup using stand-alone devices:

1. Configure a device on the Sun StorEdge EBS server. For more information, refer to the *Sun StorEdge Enterprise Backup Software Administrator's Guide*.

2. Insert a volume into the configured device.
3. Label the volume with the Default label template:
 - a. Select the device.
 - b. Select Label from the main window. The Sun StorEdge EBS Administrator program displays the preconfigured label templates.
 - c. Select the Default pool.
 - d. Click OK.
4. Mount the volume in the drive by selecting Mount from the main window.
5. Configure the Sun StorEdge EBS client:
 - a. From the menubar of the main window, select Clients>Client Setup.
 - b. In the Clients attribute, select the Sun StorEdge EBS server host.
 - c. In the Save set attribute, click Add, overwrite the text in the Save set field with the path of a single file to be backed up, such as `/usr/etc/hosts`, and then click Change.
 - d. Click Apply to apply changes.
6. Test the group backup:
 - a. Click the Group Control button on the toolbar of the main window. The Group Control window appears with the Default group highlighted.
 - b. Click Start.
7. To view the progress of the test backup, select Details from the Group Control window. Messages appear in the panels of the main window as the backup progresses.
8. To view the client file index entries, click the Indexes button on the toolbar of the main window. These entries were created during the test backup. Entries that indicate what data was backed up should appear under Save Sets.

If the test backup was not successful, refer to the troubleshooting information in the *Sun StorEdge Enterprise Backup Software Administrator's Guide* to determine the cause.

Changing the Sun StorEdge EBS Servers with Access to a Client

To limit the servers authorized to access a client, specify a list of trusted Sun StorEdge EBS servers for a client in the `/nsr/res/servers` file.



Caution – If the `/nsr/res/servers` file is empty or does not exist, any Sun StorEdge EBS server is authorized to:

- Access and back up the client
 - Perform a directed recover to the client
-

After installing the client, storage node, and server software, use the following procedure to change the Sun StorEdge EBS servers that are authorized to access a client.

▼ To Change Client Access

To change which Sun StorEdge EBS servers can access a client:

1. Enter the following command to shut down the Sun StorEdge EBS daemons:

```
# nsr_shutdown
```

2. Edit or create the `/nsr/res/servers` file and add the set of Sun StorEdge EBS servers, one per line, that require access to the client. The first entry in this file becomes the default Sun StorEdge EBS server.
3. If necessary, remove the `-s` option from the `nsrexecd` command that is invoked by the boot-time startup file. Running `nsrexecd` with the `-s` option supersedes the `/nsr/res/servers` file:
 - a. Check the Sun StorEdge EBS boot-time startup file to see whether `nsrexecd` is being run with the `-s` option. The boot-time startup file for the Solaris environment is `/etc/init.d/networker`.
 - b. If the `-s` option exists in the boot-time startup file, remove all occurrences of `-s server_name` in the startup file.

4. Start the Sun StorEdge EBS daemons. Use the following command to start the Sun StorEdge EBS daemons in the Solaris operating environment:

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

5. Verify that the Sun StorEdge EBS daemons shown in [TABLE 2-2 on page 36](#) are running by entering the following command:

```
# ps -ef | grep nsr
```

Note – The Sun StorEdge EBS daemon `nsrmmmd` will only be present if one or more devices are enabled.

TABLE 2-2 Sun StorEdge EBS Daemons

Sun StorEdge EBS Installation Packages	Sun StorEdge EBS Daemons
Sun StorEdge EBS server	<code>nsrd</code> , <code>nsrexecd</code> , <code>nsrindexd</code> , <code>nsrmmdbd</code> , <code>nsrmmmd</code>
Sun StorEdge EBS client	<code>nsrexecd</code>
Sun StorEdge EBS storage node	<code>nsrexecd</code> , <code>nsrmmmd</code>

Uninstalling the Sun StorEdge EBS Software

Use the **pkgrm** command to remove individual Sun StorEdge EBS packages or all of the Sun StorEdge EBS packages at the same time.



Caution – The Sun StorEdge EBS software packages depend on each other. Remove them in the following order: *SUNWebss*, *SUNWebsn*, *SUNWebsd*, *SUNWebsc*. The man pages (*SUNWebsm*) and document files have no dependencies and can be removed at any time.

▼ To Remove the Sun StorEdge EBS Software Packages

1. Log in as root on the system the software is being removed.
2. Enter the **nsr_shutdown** command to shut down the Sun StorEdge EBS daemons. A list of Sun StorEdge EBS daemons that will be shut down appears, along with a prompt that asks whether to continue with the **nsr_shutdown** command.
3. Enter the **pkgrm** command to remove the software. For example:
 - To remove *all* the packages, enter the following command:

```
# pkgrm SUNWebss SUNWebsn SUNWebsd SUNWebsc SUNWebsm
```



Caution – Do not choose the default option All to remove the Sun StorEdge EBS software packages. Choosing this option removes all the software packages (not just Sun StorEdge EBS software) that were installed on the computer using the **pkgadd** utility.

- To remove *only* the:
 - Server software, enter the following command:

```
# pkgrm SUNWebss
```

- Storage node software, enter the following command:

```
# pkgrm SUNWebsn
```

- Device driver software, enter the following command:

```
# pkgrm SUNWebsd
```

This removes the **SUNWebsd** package from the server or storage node where the device driver software is installed.

- Client software, enter the following command:

```
# pkgrm SUNWebsc
```

- Sun StorEdge EBS man pages, enter the following command:

```
# pkgrm SUNwebsm
```

This removes the **SUNwebsm** package from the server, storage node, or client where the man pages are installed.

Updating from a Previous Sun StorEdge EBS Release

This chapter explains how to update from a previous release of Sun StorEdge Enterprise Backup Software software. It includes the following sections:

- [“Introduction” on page 39](#)
- [“Conversion Requirements” on page 39](#)

Introduction

When updating to Sun StorEdge EBS release 7.0 from a release earlier than Solstice Backup 6.0, the client file indexes and media database must be converted to a new format.



Caution – This is a one-way conversion. Once the client file indexes and the media database have been updated to Sun StorEdge EBS release 7.0, these objects cannot be reverted for use by a previous release of the Sun StorEdge EBS software.

Conversion Requirements

Converting the Sun StorEdge EBS indexes from Sun StorEdge EBS 5.x to Sun StorEdge EBS 7.0 requires enough free disk space to match the largest client file index being converted. This space is used during the conversion process and will be

released when completed. Following conversion, the media database should be approximately twice its original size. The client file indexes will be 20% to 40% smaller. These storage requirement changes are permanent.

The following sections explain how to complete the update process and convert the indexes:

- [“Task 1: Prepare to Update the Sun StorEdge EBS Software” on page 40](#)
- [“Task 2: Update the Sun StorEdge EBS Software” on page 40](#)
- [“Task 3: Enable and Register the Software” on page 42](#)

Task 1: Prepare to Update the Sun StorEdge EBS Software

To prepare to update the Sun StorEdge EBS software:

1. See [“Conversion Requirements” on page 39](#) to determine whether all criteria to complete the index conversion is met.
2. Back up all client file indexes and generate a bootstrap for the server.

If there is not a current bootstrap and backup of all client file indexes, perform scheduled backups on all clients before updating to the next Sun StorEdge EBS release.

For example, to save the bootstrap information, enter the following command:

```
# savegrp -O group
```

Note: Make sure that all clients are included in the groups that are backing up.

3. Record the latest bootstrap save set ID and its associated volume label. To obtain this information, use the following command:

```
# mminfo -B
```

4. If the Sun StorEdge EBS software is not currently installed in the default location, record the location of the client file indexes.

Task 2: Update the Sun StorEdge EBS Software

To update the Sun StorEdge EBS software:

1. Shut down the Sun StorEdge EBS software using the following command:

```
# nsr_shutdown
```

2. Remove the earlier Sun StorEdge EBS release, but do *not* remove the client file indexes, the resource files, and media database.

For more information, see [“Uninstalling the Sun StorEdge EBS Software” on page 36](#).

3. Install the new release of the Sun StorEdge EBS software. For more information, see [“Installing the Sun StorEdge EBS Software” on page 25](#).



Caution – Do not start the Sun StorEdge EBS daemons.

4. Apply any required Sun StorEdge EBS software patches.
5. Restart the Sun StorEdge EBS software by running the Sun StorEdge EBS startup script:

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

The media database and the client file index are converted automatically.

The client file index conversion can be enhanced by running multiple instances of the `nsrck` program concurrently. This process converts multiple client file indexes in parallel. To convert multiple client file indexes in parallel, perform one of the following:

- Specify the client file index to convert, as follows:

```
# nsrck client_name
```

- Enter the `nsrck` command without a client name. This initiates the conversion of the next client in the list.

Each instance of `nsrck` occupies a portion of the server’s processing, memory, and space- swapping capability. Balance the speed of index conversion against other Sun StorEdge EBS server needs. Monitor system performance using a diagnostic tool to determine the optimum number of `nsrck` instances to launch.

6. Once the media database is converted, run scheduled backups. These backups however, are not browsable until the associated client is converted.

Task 3: Enable and Register the Software

To enable and register the Sun StorEdge EBS software, see [Chapter 6](#).

New Resource Database Replaces `nsr.res` and `nsrjb.res` Files

In Sun StorEdge EBS releases earlier than 7.0, all resource information was stored in `*.res` files. To provide better performance and improved scalability, Sun StorEdge EBS 7.0 replaces the following files with a new Sun StorEdge EBS resource database:

```
/nsr/res/nsr.res  
/nsr/res/nsrjb.res
```

The configuration information these files contained now resides in the following directory structure:

```
/nsr/res/nsrdb/00  
.  
.  
.  
/nsr/res/nsrdb/09
```

Within this directory structure, each resource is stored in a separate numbered file. As new resources are created (for example, Client, Group, or Pool resources), new files are added in these directories.

Because client resources are generally very small, the Sun StorEdge EBS client (`nsrexecd`) continues to use the `/nsr/res/nsr1a.res` file.

Installing Sun StorEdge EBS Software in a Sun Cluster Version 3.0 Environment

This chapter explains how to install Sun StorEdge EBS software in a Sun Cluster 3.0 environment. It includes the following sections:

- “Cluster Concepts and Terminology” on page 44
- “Installation Requirements” on page 46
- “System Information Requirements for a Highly Available Sun StorEdge EBS Server” on page 48
- “Installing Sun StorEdge EBS Software in a Cluster” on page 52
- “Configuring an External Client to a Virtual Server” on page 73
- “Defining Ownership of a Raw Partition for Virtual Clients” on page 74
- “Uninstalling the Sun StorEdge EBS Software” on page 75
- “Sun StorEdge EBS Cluster Script” on page 76

A Sun Cluster 3.0 system enables applications to be run and administered as highly available resources (data services). For detailed information about Sun Cluster 3.0, refer to the *Sun Cluster System Administration Guide*.



Caution – Highly available storage nodes are *not* supported.

Cluster Concepts and Terminology

This section discusses the following:

- [“Cluster Terminology” on page 44](#)
- [“About Clustering” on page 44](#)
- [“Cluster-Aware and Cluster-Unaware Sun StorEdge EBS Servers” on page 46](#)

Cluster Terminology

For consistency and clarity, this section defines the following terms:

Node — A physical machine that is a member in the cluster.

Failover node — A cluster node to which the Sun StorEdge EBS virtual server can fail over.

Virtual client — A Sun StorEdge EBS client that is associated with a highly available or scalable service in a cluster.

Cluster client — A Sun StorEdge EBS cluster client is either a physical client or a virtual client. A physical client resource backs up data belonging to a physical node within a cluster. A *virtual* client resource backs up data belonging to a highly available or scalable service within a cluster.

Virtual server — A Sun StorEdge EBS server that is configured as a highly available application within a cluster.

Stand-alone Sun StorEdge EBS server — A Sun StorEdge EBS server that is *not* highly available.

Cluster-aware Sun StorEdge EBS server — A Sun StorEdge EBS server that can recognize cluster clients.

About Clustering

Clustering means that two or more nodes are connected and appear to network users as a single, highly available system. A highly available system allows the application services to continue despite most hardware or software failures. *Each cluster node has its own IP address.* Each cluster node might also have *private* (local) resources or

disks that are available only to that computer. In addition to the nodes, a cluster can have one or more *virtual services*, each with its own IP address. A *virtual service* can have zero or more shared disks.

FIGURE 4-1 on page 45 displays a general cluster configuration consisting of two or more nodes and at least one Sun StorEdge EBS server. In this illustration:

- Node 1 is a computer with its own **Local Disk**.
- Node 2 is a computer with its own **Local Disk**.
- Highly available Sun StorEdge EBS Server on the Virtual Server owns **Shared Disks**.

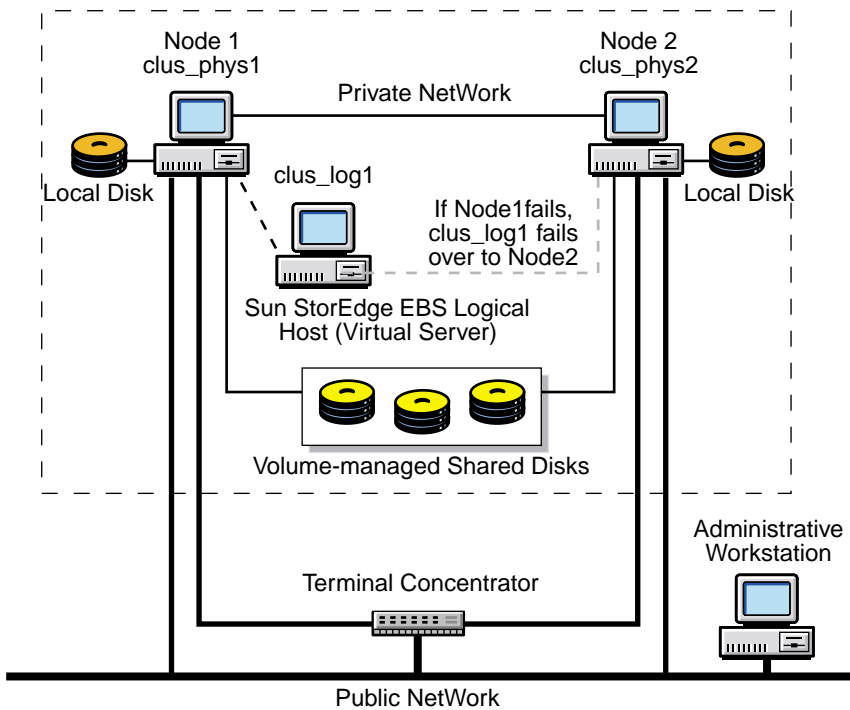


FIGURE 4-1 General Cluster Configuration

In this example, the Sun StorEdge EBS server can fail over between Node 1 and Node 2; however, the Sun StorEdge EBS server only runs on one node at a time.

The Sun StorEdge EBS server inherits the virtual server's IP address. Although Sun StorEdge EBS software is installed on all the physical nodes within the cluster, the server software is active on only one node at a time. If a hardware or software breakdown occurs on the node on which the Sun StorEdge EBS server is running, the Sun StorEdge EBS server moves to another node in the cluster.

The Sun StorEdge EBS client software runs on all the physical nodes within the cluster, regardless of whether or not the Sun StorEdge EBS server resource group is running. This allows the backup of the physical client to proceed, as long as the node is running. Only one instance of the client software (`nsrexecd`) runs on each physical node within the cluster. The Sun StorEdge EBS client software is designed to recognize more than one client (physical client plus virtual client) that might be associated with a single physical node.

Cluster-Aware and Cluster-Unaware Sun StorEdge EBS Servers

To perform scheduled backups within a cluster, a cluster-aware Sun StorEdge EBS server and Sun StorEdge EBS client must be installed.

Note – Not all Sun StorEdge EBS servers and clients are cluster-aware. For example:

- If a Sun StorEdge EBS *server* does not have cluster-client support, it *cannot* recognize cluster clients. When a scheduled backup is performed, the Sun StorEdge EBS server backs up only the private data of the physical node. The data is backed up to the same index representing the physical node.
- If a Sun StorEdge EBS *client* does *not* have cluster-client support, it backs up all data that belongs to the virtual servers and physical nodes into the same index representing the physical node. It does *not* recognize the difference between virtual and physical clients.

For more information, refer to the Legato Compatibility Guides on the Legato web site at www.legato.com.

Installation Requirements

The following sections discuss the software and hardware required to install and configure the Sun StorEdge EBS server or client software within a Sun Cluster 3.0 environment:

- [“Software Requirements” on page 47](#)

- “Hardware Requirements” on page 47
- “Configuration Options” on page 47
- “System Information Requirements for a Highly Available Sun StorEdge EBS Server” on page 48

Before proceeding, review the “Software Installation Roadmap” on page 21. For the most up-to-date information regarding software and hardware requirements, refer to the Legato Compatibility Guides on the Legato web site at www.legato.com.

Software Requirements

To install a Sun StorEdge EBS virtual server, make sure that the following software is installed on each node in the cluster:

- Solaris 8 or Solaris 9 operating environment
- Sun Cluster version 3.0 with update 1 or later update releases
- Volume Manager software (Solaris Volume Manager or Veritas Volume Manager)
- Solstice Backup release 6.1 with jumbo patch 111962-07 or Sun StorEdge EBS 7.0 or later

Note that Sun StorEdge EBS 7.0 is certified with Sun Cluster 3.0U3.

Hardware Requirements

To install the Sun StorEdge EBS software, make sure that the following hardware requirements are met for server installation only:

- Multihosted disks that are used as a mount point for global filesystems to contain the shared `/nsr` area.
- A device with local affinity for the local bootstrap backup that is connected to all the nodes within the cluster.

Configuration Options

For information on how to configure the following, refer to the *Sun StorEdge Enterprise Backup Software Administrator's Guide*:

- Tape libraries with a Sun StorEdge EBS virtual server
- Remote physical storage node with a Sun StorEdge EBS virtual server

System Information Requirements for a Highly Available Sun StorEdge EBS Server

FIGURE 4-2 and TABLE 4-1 display the system information needed to install a highly available Sun StorEdge EBS software within a Sun Cluster 3.0 environment.

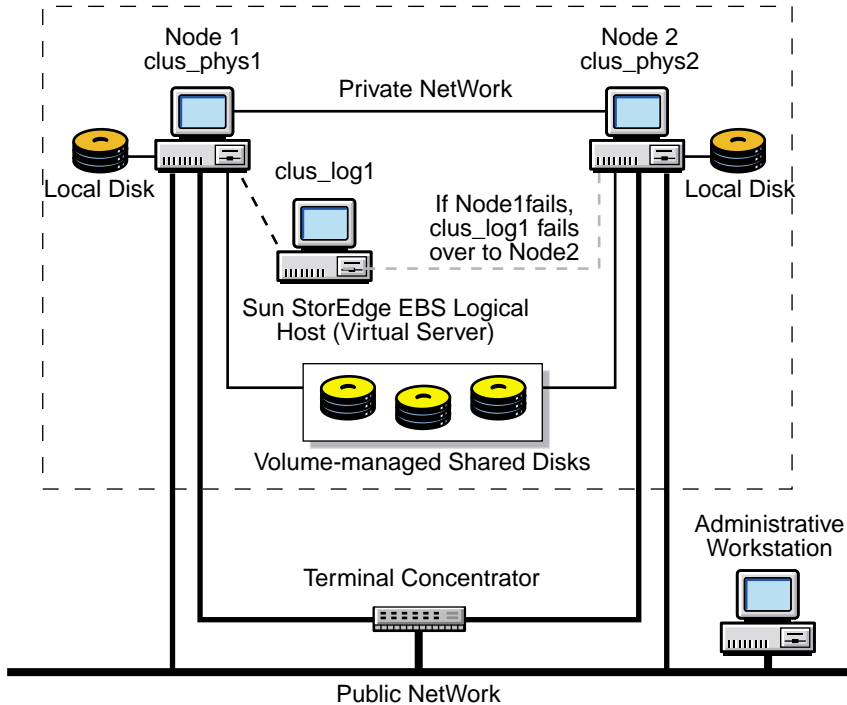


FIGURE 4-2 Sample Cluster Configuration

TABLE 4-1 Required Information: Highly Available Sun StorEdge EBS Server (1 of 2)

Information Required	Example
Sun StorEdge EBS virtual hostname with an IP address in the same subnet as the cluster nodes	clus_vir1 192.168.1.10
Sun StorEdge EBS globally mounted configuration area	/global/nw
Sun StorEdge EBS cluster configuration script	/usr/sbin/nsr/networker.cluster

TABLE 4-1 Required Information: Highly Available Sun StorEdge EBS Server (2 of 2)

Information Required	Example
Sun StorEdge EBS server resource group start script	/usr/sbin/nsr/networker.start
Sun StorEdge EBS server resource group stop script	/usr/sbin/nsr/networker.stop
Sun StorEdge EBS server resource group monitor start script	/usr/sbin/nsr/networker.fm_start
Sun StorEdge EBS server resource group monitor stop script	/usr/sbin/nsr/networker.fm_stop
File containing the host ID of all the cluster members	/nsr/res/hostids

Updating from a Previous Release of Sun StorEdge EBS Software

Use the following procedure to update from Solstice Backup release 6.x to Sun StorEdge EBS release 7.0 on Sun Cluster 3.0.

Note – To update to Sun Cluster 3.0 in a Solaris 8 or Solaris 9 operating environment, update to Sun StorEdge EBS release 7.0.

To update from a previous release of Sun StorEdge EBS software:

1. Make sure that the `PATH` environment variable includes `/usr/sbin` and `/opt/sunwcluster/bin`.
2. On the node currently running the Sun StorEdge EBS server logical host:
 - a. Make sure that all backups are up-to-date.
 - b. Shut down the Sun StorEdge EBS software on the server using the following command:

```
# hareg -n networker

# nsr_shutdown
```

- c. Save a copy of the server's `/nsr` databases. These global databases are located in the shared disks within the cluster and are needed after the upgrade.

Use *one* of the following methods (note that the PATH environment variable should be set to include `/usr/lib/nsr` in order for the following examples to work; otherwise use the full path `/usr/lib/nsr/uasm` should be used.):

- Save the global databases to a file to later ftp to a remote computer for safekeeping:

```
# cd /virtual_hostname/nsr  
  
# uasm -s -i . > filename
```



Caution – Make sure *not* to overwrite the Sun StorEdge EBS storage tapes.

- Save the global databases to a local tape drive:

```
# cd /virtual_hostname/nsr  
  
# uasm -s -i . | dd of=tapename
```

- Save the global databases directly to a remote file or tape drive:

```
# cd /virtual_hostname/nsr  
  
# uasm -s -i . | rsh remote_machine dd of=remote_filename
```

3. For all nodes in the cluster:

- Install the Solaris 8 or Solaris 9 operating environment and Sun Cluster 3.0U3 software.
- Boot the computer in cluster mode.

For detailed information about how to install Solaris the 8 and Solaris 9 operating environment and Sun Cluster 3.0U3 software, refer to the appropriate Sun documentation.

4. On each node in the cluster, install the Sun StorEdge EBS software. Perform the following tasks:

- [“Task 1: Install the Sun StorEdge EBS Software” on page 52](#)
- [“Task 2: Define the Sun StorEdge EBS Server as Highly Available” on page 54](#)

- [“Task 3: Create an Instance of the Sun StorEdge EBS Server Resource Group” on page 55](#)

5. On the node that is currently running the Sun StorEdge EBS server resource group:

- a. Stop the Sun StorEdge EBS resource group:

```
# scswitch -F -g resource_group_name
```

- b. Go to the global `/nsr` directory and delete its contents:

```
# cd /global/nw/nsr
# rm -rf *
```

- c. Restore the contents of the `/nsr` directory to the global area using *one* of the following methods:

- Copy the file back to the server and restore it:

```
# uasm -r < filename
```

- Recover the file from the local tape drive:

```
# dd if=tapename | uasm -r
```

- Recover the file from the remote file or tape:

```
# rsh remote_machine dd if=remote_filename | uasm -r
```

6. Restart the Sun StorEdge EBS software:

```
# scswitch -Z -g resource_group_name
```

7. Continue configuring the Sun StorEdge EBS server. Perform the following tasks:

- [“Task 4: Grant Access to the Highly Available Sun StorEdge EBS Server” on page 57](#)
- [“Task 5: Configure the Sun StorEdge EBS Server” on page 60](#)
- [“Task 6: Configure Clients under the Sun StorEdge EBS Server” on page 60](#)

- [“Task 7: Create Instances of the Sun StorEdge EBS Client Resource Type” on page 62](#)
- [“Task 8: Register Licenses for the Highly Available Sun StorEdge EBS Server” on page 64](#)

Installing Sun StorEdge EBS Software in a Cluster

To install the Sun StorEdge EBS software in a Sun Cluster 3.0 environment, see the following:

- [“Installing a Sun StorEdge EBS Virtual Server” on page 52](#)
- [“Installing Only the Sun StorEdge EBS Client Software in a Cluster” on page 67](#)

Installing a Sun StorEdge EBS Virtual Server

To install and configure the Sun StorEdge EBS software as a highly available service in a cluster, perform the following tasks:

- [“Task 1: Install the Sun StorEdge EBS Software” on page 52](#)
- [“Task 2: Define the Sun StorEdge EBS Server as Highly Available” on page 54](#)
- [“Task 3: Create an Instance of the Sun StorEdge EBS Server Resource Group” on page 55](#)
- [“Task 4: Grant Access to the Highly Available Sun StorEdge EBS Server” on page 57](#)
- [“Task 5: Configure the Sun StorEdge EBS Server” on page 60](#)
- [“Task 6: Configure Clients under the Sun StorEdge EBS Server” on page 60](#)
- [“Task 7: Create Instances of the Sun StorEdge EBS Client Resource Type” on page 62](#)
- [“Task 8: Register Licenses for the Highly Available Sun StorEdge EBS Server” on page 64](#)

Task 1: Install the Sun StorEdge EBS Software

The Sun StorEdge EBS software must be installed on all nodes in the cluster that are required to run the Sun StorEdge EBS resource group.



Caution – Make sure that the Solaris 8 or Solaris 9 operating environment and Sun Cluster 3.0U3 software are already installed on all cluster nodes and that those nodes boot in cluster mode.

Also, make sure that the `PATH` environment variable includes `/usr/sbin` and `/usr/cluster/bin`.

To install the Sun StorEdge EBS software on nodes that will be running the Sun StorEdge EBS resource group:

1. Access the Sun StorEdge EBS software from the distribution media. For detailed installation instructions, refer to [Chapter 2](#).
2. Keep a copy of the current configuration. The Sun StorEdge EBS software installation script modifies the `/etc/rpc` and `/etc/syslog.conf` files during the installation process. Enter the following commands:

```
# cp /etc/rpc /etc/rpc.old  
  
# cp /etc/syslog.conf /etc/syslog.conf.old
```

3. Enter the `pkgadd` command as follows:

```
# pkgadd -d .
```

4. Press [Enter] to install all of the packages on the server. Sun recommends installing all the software on the server at the same time.



Caution – Start the Sun StorEdge EBS daemons *only* after the last Sun StorEdge EBS package is installed.

Install selected software packages in the following order:

- `SUNWebsc` (client software package)
- `SUNWebss` (device drivers package)
- `SUNWebsn` (storage node software package)
- `SUNWebss` (server software package)
- `SUNWebsm` (optional man pages)

5. Start the Sun StorEdge EBS daemons:

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

6. Press [q] to exit.

Task 2: Define the Sun StorEdge EBS Server as Highly Available

To define and configure the Sun StorEdge EBS server as highly available:

1. Log in as root.
2. Make sure that the `/etc/hosts` file on each cluster node contains the name of the logical host. The logical hostname can be published in the Domain Name System (DNS) or Network Information Services (NIS).
3. From each node in the cluster that will run the Sun StorEdge EBS server process:

- a. Run the cluster configuration script `networker.cluster` located in `/usr/sbin/nsr`. For an example of the script, see [“Sun StorEdge EBS Cluster Script” on page 76](#).

This script defines the `LGTO.serv` and the `LGTO.clnt` resource types that the Sun StorEdge EBS software requires.

- b. In response to the following prompts, enter the following information:

```
Enter directory where local NetWorker database is installed
[/nsr]?
```

- Enter the location of the local Sun StorEdge EBS database directory provided during the installation procedure. For example: `/space/nsr`

```
Do you wish to configure for both NetWorker server and
client?
```

```
Yes or No [Yes]?
```

- Enter **Yes** to configure the server software. This also installs the client software by default.

- Enter **No** to configures only the client software.

```
Do you wish to add now the site-specific values for:
```

```
NSR_SHARED_DISK_DIR and NSR_SERVICE_ID
```

```
Yes or No [Yes]?
```

- Enter **Yes** to ensure compatibility with other cluster environments.

Enter the Logical Hostname to be used for NetWorker?

- Enter the published logical hostname to be used by the highly available Sun StorEdge EBS server. For example: *clus_vir1*

In what path will this nsr directory be created/located?

- Enter the pathname of the globally mounted */nsr* directory that will contain the configuration information for the highly available Sun StorEdge EBS server. For example: */global/nw*.

Notes:

- The examples used in this procedure refer to the examples found in [“System Information Requirements for a Highly Available Sun StorEdge EBS Server” on page 48](#).
- To undo any changes to the configuration, run the `networker.cluster -r script` and then run the `networker.cluster script` again.

Task 3: Create an Instance of the Sun StorEdge EBS Server Resource Group

A resource group must be created for the highly available Sun StorEdge EBS server. It must contain the following resources:

- Logical hostname
- Globally mounted filesystem for the */nsr* area
- `LGTO.serv` resource
- `LGTO.clnt` resource

To create an instance of the Sun StorEdge EBS server resource group, perform the following steps on one node in the cluster:

1. Create a resource group:

```
# scrgadm -a -g networker
```

2. Add the logical host:

```
# scrgadm -a -L -g networker -l clus_vir1
```

3. Create an instance of the `LGTO.serv` resource type that has a dependency on the logical host. Specify a configuration directory for the global `/nsr` area. For example:

```
# scrgadm -a -j server -t LGTO.serv -g networker \  
-y resource_dependencies=clus_vir1 -x config_dir=/global/nw
```

4. Create an instance of the `LGTO.clnt` resource type. For example:

```
# scrgadm -a -j client -t LGTO.clnt -g networker \  
-x clientname=clus_vir1 -x owned_paths=/global/nw
```

5. Start the Sun StorEdge EBS resources, as follows:

```
# scswitch -z -g networker
```

Example: A Highly Available Sun StorEdge EBS Server

In the following example, a highly available Sun StorEdge EBS server uses the logical hostname `backup_server`. The highly available Sun StorEdge EBS server uses `/global/networker` (globally mounted filesystem) as its configuration directory.

1. Create a resource group with the name `backups`:

```
# scrgadm -a -g backups
```

2. Add the logical hostname resource type to the resource group created in the previous step:

```
# scrgadm -a -L -g backups -l backup_server
```


3. Create an instance of the `LGTO.serv` resource type with the name `networker_server`. This resource belongs to the resource group `backups` and has a dependency on the logical host created in the previous step. Specify the configuration directory on the globally mounted filesystem `/global/networker`:

```
# scrgadm -a -j networker_server -t LGTO.serv -g backups \  
-y resource_dependencies=backup_server \  
-x config_dir=/global/networker
```

4. The Sun StorEdge EBS logical host is also a client of the highly available Sun StorEdge EBS server. Create an instance of the `LGTO.clnt` resource type for the logical host `backup_server` within the resource group `backups`. The name of this resource is `networker_client`:

```
# scrgadm -a -j networker_client -t LGTO.clnt -g backups \  
-x clientname=backup_server -x owned_paths=/global/networker
```

5. Start the highly available service associated with the resource group `backups`.

```
# scswitch -Z -g backups
```

Task 4: Grant Access to the Highly Available Sun StorEdge EBS Server

Before a Sun StorEdge EBS server can back up a client, the client must grant the server access. Granting access is controlled by the `servers` file. For the node that is running the Sun StorEdge EBS server resource group, this file is located in the globally mounted filesystem. Otherwise, this file is located on a local disk.



Caution – If the `/nsr/res/servers` file is empty or does not exist, any Sun StorEdge EBS server is authorized to:

- Access and back up the client
 - Perform a directed recover to the client
-

To grant access to the highly available Sun StorEdge EBS server:

1. On one node in the cluster:

- a. Stop the Sun StorEdge EBS service using the cluster management software, as follows:

```
# scswitch -F -g networker
```

- b. Edit or create the `servers` file in the globally mounted `/nsr` area. For example, `/global/nw/res/servers`:

- Add the set of Sun StorEdge EBS servers, one per line, to be granted access to this client.
- Add an entry for the Sun StorEdge EBS logical hostname first. Then add entries for each physical host that can run the Sun StorEdge EBS resource group.

For example:

```
clus_vir1
```

```
clus_phys1
```

```
clus_phys2
```

2. On each node in the cluster:

- a. Shut down the Sun StorEdge EBS processes and verify that all Sun StorEdge EBS daemons have stopped:

```
# nsr_shutdown  
  
# ps -ef |grep nsr
```

- b. Check the Sun StorEdge EBS boot-time startup file to see whether **nsrexecd is being run with the -s option**. If the `-s` option exists, remove all occurrences of `-s servername` in the file.

c. Edit or create the `/nsr.NetWorker.local/res/servers` file:

- Add the set of Sun StorEdge EBS servers, one per line, that require access to this client.
- Add an entry for the Sun StorEdge EBS logical hostname first. Then add entries for each physical host that can run the Sun StorEdge EBS resource group.

For example:

```
clus_vir1
clus_phys1
clus_phys2
```

d. Restart the Sun StorEdge EBS processes:

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

3. On one node in the cluster, start the Sun StorEdge EBS service using the cluster management software, as follows:

```
# scswitch -z -g networker
```

4. If required, grant access to the Sun StorEdge EBS virtual server on clients outside of the cluster:

On each client that is outside of the cluster:

a. Shut down the Sun StorEdge EBS processes:

```
# nsr_shutdown
```

b. Verify that all Sun StorEdge EBS daemons have stopped:

```
# ps -ef |grep nsr
```

c. Edit or create the `/nsr/res/servers` file:

- Add the set of Sun StorEdge EBS servers, one per line, that require access to this client.
- Add an entry for the Sun StorEdge EBS logical hostname first. Then add entries for each physical host that can run the Sun StorEdge EBS resource group.

For example:

```
clus_vir1
clus_phys1
clus_phys2
```

- d. Restart the Sun StorEdge EBS processes:

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

Task 5: Configure the Sun StorEdge EBS Server

To configure the Sun StorEdge EBS server:

1. Log in as root on the cluster node that is currently running the Sun StorEdge EBS server resource group.
2. Start the Sun StorEdge EBS Administrator program:

```
# nwadmin -s clus_vir1
```

3. From the Server menu, select Server Setup.
4. In the Server dialog box, add entries in the Administrator attribute for any cluster nodes that are not listed. For example:
root@hostname
5. Click Add and then click Apply.

Task 6: Configure Clients under the Sun StorEdge EBS Server

When the `networker.cluster` script runs, it creates a symbolic link named `/nsr` that points to a local disk. It also creates a second link named *nsr.NetWorker.local* that points to the local Sun StorEdge EBS directory. For example, if the local Sun StorEdge EBS directory was created in `/var/nsr`, each client member has the following links:

- `/nsr->/nsr.NetWorker.local`
- `/nsr.NetWorker.local->/var/nsr`

To configure each client under the Sun StorEdge EBS server:

1. From one node in the cluster, start the Sun StorEdge EBS Administrator program:

```
# nwadmin -s clus_vir1
```

2. (Optional) Define save groups as required:
 - a. From the Customize menu, select Groups.

- b. In the Groups window, select Details from the View menu.
- c. Click Create to create a new save group.



Caution – Save groups must have the Autorestart attribute enabled and the Manual Restart option disabled in order for their save sets to restart after a virtual client or Sun StorEdge EBS server failover.

- d. For each save group, click Enabled in the Autorestart attribute.
 - e. For each save group, make sure that the Manual Restart option is unchecked in the Options check box.
 - f. Define the remaining attributes and click Apply.
3. Make each physical client within the cluster a Sun StorEdge EBS client of the virtual Sun StorEdge EBS server.

For each physical client in the cluster:

- a. In the Sun StorEdge EBS Administrator program, select Client Setup from the Clients menu.
 - b. If these steps are being performed after updating the Sun StorEdge EBS server, click on the client name. Otherwise, click Create and enter the name of the physical client for the Name attribute.
 - c. In the Remote Access attribute, add entries for each physical client within the cluster. For example:
root@clus_phys1
 - d. For the Group attribute, select a group.
 - e. Define the remaining attributes in the Client dialog box, click Add, and click Apply.
4. Make each virtual client within the cluster a Sun StorEdge EBS client of the virtual Sun StorEdge EBS server.

For each virtual client in the cluster:

- a. In the Sun StorEdge EBS Administrator program, select Client Setup from the Clients menu.
- b. In the Clients dialog box, if these steps are being performed after updating the Sun StorEdge EBS server, click the client name in the client list. Otherwise, click Create and enter the name of the virtual client for the Name attribute.
- c. In the Remote Access attribute, add entries for each physical client within the cluster. For example:

root@clus_phys1

- d. For the Group attribute, select a group.
- e. Define the remaining attributes in the Clients dialog box, click Add, and click Apply.

The first time the Sun StorEdge EBS application runs, it creates the Client resource for the highly available Sun StorEdge EBS server.

Task 7: Create Instances of the Sun StorEdge EBS Client Resource Type

An instance of the Sun StorEdge EBS Client resource type must be created for each virtual client that accesses data on globally mounted filesystems. Virtual clients in Sun Cluster 3.0 are either logical hostnames or shared addresses.



Caution – All globally mounted filesystems (except the `/global/.devices/...` filesystems) must be owned by a resource group and defined in a Sun StorEdge EBS Client resource type. If the filesystems are not properly configured, multiple copies will be backed up for each cluster node.

To back up the data for a virtual client:

1. Create an instance of the Sun StorEdge EBS Client resource as part of an existing resource group that contains a logical host or shared addresses. For example:

```
# scrgadm -a -j resource_name -g resource_group_name -t LGTO.clnt \  
-x clientname=virtual_hostname -x owned_paths=pathname_1, pathname_2[,...]
```

The *virtual_hostname* variable is either a logical hostname or shared address. For more information, see the following examples:

- [“Example: A Highly Available Informix Database Server” on page 63](#)
 - [“Example: A Scalable Apache Web Server” on page 63](#)
2. Run a test probe to verify that the Client and Group resources are properly configured.

On the node on which the Sun StorEdge EBS server resides, run the following command:

```
# savegrp -pv -c client_name savegroup_name
```

If the test probe does not display the scheduled backups and index, refer to the section on "Tracking Scheduled Saves" in the *Sun StorEdge Enterprise Backup Software Administrator's Guide*.

Example: A Highly Available Informix Database Server

In the following example, the Informix database server is configured to use the DNS registered hostname *informix_lhrs*. An existing failover resource group named *informix_rg* contains a:

- *SUNW.informix* resource named *informix_res*
- *SUNW.LogicalHostname* resource named *informix_lhrs*

This *SUNW.informix* database server can access data on a global filesystem under */global/informix/config* and */global/informix/db*.

To add a Sun StorEdge EBS virtual client to the existing resource group *informix_rg*, enter the following command:

```
# scrgadm -a -j informix_clntrs -g informix_rg -t LGTO.clnt \  
  
-x clientname=informix_lhrs \  
  
-x owned_paths=/global/informix/config,/global/informix/db
```

Example: A Scalable Apache Web Server

In the following example, an Apache web server is configured to use the DNS registered hostname *apache_sars*. An existing scalable resource group named *apache_rg* contains a:

- *SUNW.apache* resource named *apache_res*
- *SUNW.SharedAddress* resource named *apache_sars*

This Apache web server accesses data on a global filesystem under */global/web/config* and */global/web/data*.

To add a Sun StorEdge EBS virtual client to the existing resource group *apache_rg*, enter the following command:

```
# scrgadm -a -j apache_clntrs -g apache_rg -t LGTO.clnt \  
  
-x clientname=apache_sars \  
  
-x owned_paths=/global/web/config,/global/web/data
```

Task 8: Register Licenses for the Highly Available Sun StorEdge EBS Server



Caution – Of the various Sun StorEdge EBS editions, only the Power Edition supports backup and recover for a highly available Sun StorEdge EBS server; therefore a Power Edition license is required. Power Edition includes two Cluster Client licenses of the same platform type; adding any additional cluster clients requires additional Cluster Client Connection licenses.

To register and license the highly available Sun StorEdge EBS server:

1. Order licenses from Sun for the type of Sun StorEdge EBS server and client configuration you are using.

Note – If you are Registering an Update from Solstice Backup 6.x to Sun StorEdge EBS 7.0, you will need a new Update for Sun StorEdge EBS 7 enabler. Only customers with maintenance contracts will have automatically received Update for Sun StorEdge EBS 7 enablers. If you do not have a maintenance contract, order appropriate licenses for the highly available StorEdge Backup server and other desired features.

- When you receive the purchased enabler certificate in the mail, proceed to Step 2.
2. Log on to the system that is currently running the Sun StorEdge EBS resource group.
 3. Perform the following operations to enter the purchased enabler codes:
 - a. If you have been evaluating the Sun StorEdge EBS highly available software and have now purchased the software:

Upgrade from the base evaluation enabler to the purchased Power Edition base enabler by entering the following command:

```
# nsrcap -v -u base_enabler_code
```

Delete any remaining evaluation enablers using the Sun StorEdge EBS Administrator program:

```
# nwadmin -s clus_vir1
```

This eliminates warning messages due to expiring evaluation enablers.

b. For each enabler code, enter the following command:

```
# nsrcap -v -c enabler_code
```

4. Make sure that the highly available Sun StorEdge EBS server is defined as a part of the cluster.
5. On each node that is currently running the Sun StorEdge EBS server resource group, run the following command and capture the output:

```
# hostid
```

This prints the numeric identifier of the current host.

6. Log on to the computer that is currently running the Sun StorEdge EBS server resource group.
 - a. Create a file named `/nsr/res/hostids` that contains the host IDs of all the cluster nodes that were captured in the previous steps. Use the following syntax: `hostid1:hostid2:hostid3:...`
For example: `12345678:87654321:13572468`
 - b. Restart the server by taking the highly available Sun StorEdge EBS server offline and then putting it back online, as follows:

```
# scswitch -F -g networker
```

```
# scswitch -Z -g networker
```

7. On one node in the cluster:

- a. Start the Sun StorEdge EBS Administrator program using the logical hostname for the highly available Sun StorEdge EBS server:

```
# nwadmin -s clus_vir1
```

- b. From the Server menu, select Registration.
- c. Note the new host ID that appears in the Registration window. This is the composite host ID.
- d. Click Ok to close the Registration window.

Task 9: Authorize the Software



Caution – Do *not* change the logical hostname for the highly available Sun StorEdge EBS server. If you change the logical host configuration for the highly-available Sun StorEdge EBS server after you update the software, you must permanently license and authorize the highly available Sun StorEdge EBS server.

To enter the permanent authorization code for Sun StorEdge EBS servers and clients:

1. On one node in the cluster, start the Sun StorEdge EBS Administrator program using the logical hostname for the highly available Sun StorEdge EBS server:

```
# nwadmin -s clus_vir1
```

2. Select Server>Registration>View>Tabular from the main menu.

The registration window lists all enabled modules by name, serial number, composite hostid, the expiration date, and the enabler's authorization key.

- If an enabler *is* authorized, no expiration date is shown.
- If an enabler is *not* authorized, an authorization key is *not* shown.

3. Select Server>Server Setup from the main menu and then enter the following required information:

- Name
- Company
- Address
- Phone number

- Email
 - Date purchased
4. With the registration information and the composite hostid available, contact Sun. You can either:
- Call 1-800-usa4sun
 - Send email to license@sun.com.

To send email, copy and paste the registration window contents (enabler codes, composite hostid, and expiration dates) along with your name, company name, address, phone number, email address, and date of purchase into an email message. Include a brief note stating that you are requesting authorization keys.

The authorizations keys are returned within two days by the same method you use to request them.



Caution – If you *do not* enter an authorization key within the 45 day period after entering the purchased enabler code, you *cannot* back up data. However, you can recover data.

5. When the authorization keys arrive, perform the following steps:
- a. On one node in the cluster, start the Sun StorEdge EBS Administrator program using the logical hostname for the highly available Sun StorEdge EBS server:

```
# nwadmin -s clus_vir1
```

- b. Select Server>Registration from the main menu.
- c. Enter each authorization key into the Authorization Key field for the corresponding enabler and then click Apply.

Installing Only the Sun StorEdge EBS Client Software in a Cluster

In this configuration, the Sun StorEdge EBS server is running on a node that is not a member of the cluster.

To install a Sun StorEdge EBS cluster client, perform the following tasks:

- [“Task 1: Install the Sun StorEdge EBS Cluster Client Software” on page 68](#)

- “Task 2: Configure Sun StorEdge EBS Client Software as Highly Available” on page 69
- “Task 3: Create Instances of the Client Resource Type” on page 70
- “Task 4: Define the List of Trusted Sun StorEdge EBS Servers” on page 71
- “Task 5: Configure Clients under the Sun StorEdge EBS Server” on page 72



Caution – Make sure that the Sun StorEdge EBS client software is installed on each node in the cluster.

Task 1: Install the Sun StorEdge EBS Cluster Client Software



Caution – Make sure that the Solaris 8 or Solaris 9 operating environment and Sun Cluster 3.0U3 software are already installed on all cluster nodes and that those nodes boot in cluster mode.

Also, make sure that the `PATH` environment variable includes `/usr/sbin` and `/usr/cluster/bin`.

To install Sun StorEdge EBS software on the computer that is designated as the Sun StorEdge EBS client:

1. Access the Sun StorEdge EBS software from the distribution media.
For detailed installation instructions, see [Chapter 2](#).
2. Enter the **pkgadd** command at the system prompt, as follows:

```
# pkgadd -d .
```



Caution – Do *not* press the [Enter] key for the default response All. Accepting the default installs the server and the device driver packages.

3. Enter the appropriate option number to install the client package (*SUNWebsc*).
The package temporarily requires 70 MB of free space on the client computer.
4. (Optional) Enter the appropriate options number to install the man pages, (*SUNWebsm*).

5. Start the Sun StorEdge EBS daemons:

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

6. When all the applicable packages have been added, and the prompt appears, press [q] to exit.

Task 2: Configure Sun StorEdge EBS Client Software as Highly Available

To define and configure a Sun StorEdge EBS client as highly available:

1. Log in as *root* on each node where the Sun StorEdge EBS software is being installed.
2. Make sure that the */etc/hosts* file on each cluster node contains the name of the virtual host. The virtual hostname can be published in the Domain Name System (DNS) or Network Information Services (NIS).
3. For each node in the cluster:
 - a. Run the cluster configuration script, */usr/sbin/nsr/networker.cluster*. This script defines the *LGTO.clnt* resource types that the Sun StorEdge EBS software requires.
 - b. In response to the prompts, enter the following information:

```
Enter directory where local NetWorker database is installed
[/nsr]?

- Enter the location of the local Sun StorEdge EBS database directory
provided during the installation procedure. For example: /space/nsr

Do you wish to configure for both NetWorker server and
client? Yes or No [Yes]?

- Enter no. This configures only the client software.
```

Notes:

- The examples used in this procedure are in reference to the examples found in [“System Information Requirements for a Highly Available Sun StorEdge EBS Server”](#) on page 48.
- Any changes to the configuration can be undone by running the **networker.cluster -r** option and then running the **networker.cluster** script again.

Task 3: Create Instances of the Client Resource Type

An instance of the Sun StorEdge EBS Client resource type must be created for each virtual client that accesses data on globally mounted filesystems. Virtual clients in Sun Cluster 3.0 are either logical hostnames or shared addresses.



Caution – All globally mounted filesystems (except the `/global/.devices/...` filesystems) must be owned by a logical host and defined in a Sun StorEdge EBS Client resource type. If the filesystems are not properly configured, multiple copies will be backed up for each cluster node.

To back up the data for a virtual client:

From any node in the cluster, create an instance of the Sun StorEdge EBS Client resource as part of an existing resource group that contains a logical host or shared address. For example:

```
# scrgadm -a -j resource_name -g resource_group_name -t LGTO.clnt \  
-x clientname=virtual_hostname -x owned_paths=pathname_1, pathname_2[...]
```

Example: A Highly Available Informix Database Server

In the following example, the Informix database server is configured to use the DNS registered hostname `informix_lhrs`. An existing failover resource group named `informix_rg` contains a:

- `SUNW.informix` resource named `informix_res`
- `SUNW.LogicalHostname` resource named `informix_lhrs`

This `SUNW.informix` database server can access data on a global filesystem under `/global/informix/config` and `/global/informix/db`.

To add a Sun StorEdge EBS virtual client to the existing resource group *informix_rg*, enter the following command:

```
# scrgadm -a -j informix_clntrs -g informix_rg -t LGTO.clnt \  
-x clientname=informix_lhrs \  
-x owned_paths=/global/informix/config,/global/informix/db
```

Example: A Scalable Apache Web Server

In the following example, an Apache web server is configured to use the DNS registered hostname *apache_sars*. An existing scalable resource group named *apache_rg* contains a:

- SUNW.apache resource named *apache_res*
- SUNW.SharedAddress resource named *apache_sars*

This Apache web server accesses data on a global filesystem under */global/web/config* and */global/web/data*.

To add a Sun StorEdge EBS virtual client to the existing resource group *apache_rg*, enter the following command:

```
# scrgadm -a -j apache_clntrs -g apache_rg -t LGTO.clnt \  
-x clientname=apache_sars \  
-x owned_paths=/global/web/config,/global/web/data
```

Task 4: Define the List of Trusted Sun StorEdge EBS Servers

Before a Sun StorEdge EBS server can back up a client, the client must grant the server access. Granting access is controlled by the *servers* file. For the node that is currently running the Sun StorEdge EBS server resource group, this file is located in the globally mounted filesystem. Otherwise, this file is located on a local disk.



Caution – If the `/nsr/res/servers` file is empty or does not exist, any Sun StorEdge EBS server is authorized to:

- access and backup the client
 - perform a directed recover to the client
-

To define the list of trusted Sun StorEdge EBS servers, perform the following steps on each node in the cluster:

1. Shut down the Sun StorEdge EBS processes and verify that all Sun StorEdge EBS daemons have stopped:

```
# nsr_shutdown  
  
# ps -ef |grep nsr
```

2. Edit or create the `/nsr/res/servers` file and add the set of Sun StorEdge EBS servers, one per line, that require access to this client.
3. Check the Sun StorEdge EBS boot-time startup file to see whether **nsrexecd is being run with the -s option**. If the `-s` option exists, remove all occurrences of `-s servername` in the file.
4. Restart the Sun StorEdge EBS daemons:

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

Task 5: Configure Clients under the Sun StorEdge EBS Server

To configure each client under the Sun StorEdge EBS server:

1. From any node in the cluster, start the Sun StorEdge EBS Administrator program:

```
# nwadmin -s clus_vir1
```

2. Make each physical client within the cluster a Sun StorEdge EBS client of the Sun StorEdge EBS server.

For each physical client in the cluster:

- a. In the Sun StorEdge EBS Administrator program, select Client Setup from the Clients menu.

- b. In the Clients dialog box, if these steps are being performed after updating the Sun StorEdge EBS server, click on the client name in the Client list. Otherwise, click Create and enter the name of the physical client for the Name attribute.
 - c. In the Remote Access attribute, add entries for each physical client within the cluster. For example:
root@clus_phys1
 - d. For the Group attribute, select a group.
 - e. Define the remaining attributes in the Clients dialog box and click Apply.
3. Make each virtual client within the cluster a client of the Sun StorEdge EBS server.
For each virtual client in the cluster:
 - a. In the Sun StorEdge EBS Administrator program, select Client Setup from the Clients menu.
 - b. In the Clients dialog box, if these steps are being performed after updating the Sun StorEdge EBS server, click on the client name in the Clients list. Otherwise, click Create and enter the name of the virtual client for the Name attribute.
 - c. In the Remote Access attribute, add entries for each physical client within the cluster. For example:
root@clus_phys1
 - d. For the Group attribute, select a group.
 - e. Define the remaining attributes in the Clients dialog box and click Apply.
 4. Schedule backups using the Sun StorEdge EBS application. For detailed instructions, refer to the *Sun StorEdge Enterprise Backup Software Administrator's Guide, Release 7.0*.

Configuring an External Client to a Virtual Server

Use this procedure to configure and back up an external Sun StorEdge EBS client to a highly available Sun StorEdge EBS server. Before a Sun StorEdge EBS server can back up a client, the client must grant the server access. Granting access is controlled by the `servers` file. If the `servers` file does *not* exist, any Sun StorEdge EBS server can back up this client. If the `servers` file *does* exist, only the specific servers listed in the file can back up the client.

On each Sun StorEdge EBS client that is outside of the cluster:

1. Shut down the Sun StorEdge EBS processes:

```
# nsr_shutdown
```

2. Verify that all Sun StorEdge EBS daemons have stopped:

```
# ps -ef |grep nsr
```

3. Edit or create the `/nsr/res/servers` file:

- a. Add the set of Sun StorEdge EBS servers, one per line, that require access to this client.
- b. Add an entry for the Sun StorEdge EBS logical hostname first. Then add entries for each physical host that can run the Sun StorEdge EBS resource group. For example:

```
clus_vir1
```

```
clus_phys1
```

```
clus_phys2
```

Defining Ownership of a Raw Partition for Virtual Clients

To back up the raw partitions of a Sun StorEdge EBS virtual client, make sure that the raw device path appears in the owned paths field of the `LGTO.clnt` resource.

Example: A Highly Available Web Server

In the following example, a highly available web server uses the shared address `web_server`. The web server daemons are placed under the control of the resource group `apache_rg`. The daemons access files that are kept in two separate globally mounted filesystems: `/global/web/config` and `/global/web/data`. The web server also accesses the raw partition `/dev/md/hunt/dsk/d30`.

To create the Sun StorEdge EBS Client resource named *apache_nw*, enter the following:

```
# scrgadm -a -j apache_nw -g apache_rg -t LGTO.clnt \  
-x clientname=web_server \  
-x owned_paths=/global/web/config,/global/web/data,\  
/dev/md/hunt/dsk/d30
```

For more information on backing up raw partitions, refer to the `rawasm` command as described in the `uasm(1m)` man page.

Uninstalling the Sun StorEdge EBS Software

To uninstall the Sun StorEdge EBS software from a cluster environment:

1. On one node in the cluster, disable and remove all instances of the `LGTO.serv` and `LGTO.clnt` resource types in the cluster.

For more information, refer to the `scswitch(1m)` and `scrgadm(1m)` man pages.

2. On each node in the cluster:
 - a. Log in as root on the computer that the software is being removed.
 - b. Undo all changes to the configuration by running the **`networker.cluster -r`** option.
 - c. Enter the following command to shut down the Sun StorEdge EBS daemons:

```
# nsr_shutdown
```

A list of Sun StorEdge EBS daemons to be shut down appears, and you are prompted whether to continue.



Caution – The Sun StorEdge EBS software packages depend on each other. Remove the Sun StorEdge EBS software packages in the following order: *SUNWebss*, *SUNWebsn*, *SUNWebss*, *SUNWebsc*. The man pages *SUNWebsm* and document files have no dependencies—remove them at any time.

d. Enter the following command to remove *all* the packages:

```
# pkgrm SUNWebss SUNWebsn SUNWebss SUNWebsc SUNWebsm
```

Sun StorEdge EBS Cluster Script

This section demonstrates the typical responses you would give to the prompts of the **networker.cluster** script, assuming the following configuration:

- Virtual server: *clus_vir1*
- Mount point: */global/nw*

```
# networker.cluster

-----

Sun Cluster 3.0 extends the Solaris operating environment into a
cluster operating system. A cluster is a collection of loosely
coupled computing nodes that provide a single client view of
network services or applications.

To complete this procedure, one must have a logical host defined
on which the NetWorker server can be entered

-----

Do you wish to continue? [Yes]? Yes

Shutting down NetWorker services...

Enter directory where local NetWorker database is installed
[/nsr]? /space/nsr
```

Restarting syslog daemon...

Do you wish to configure for both NetWorker server and client?

Yes or No [Yes]? **Yes**

Do you wish to add now the site-specific values for:

NSR_SHARED_DISK_DIR and NSR_SERVICE_ID

Yes or No [Yes]? **Yes**

Enter the Logical Hostname to be used for NetWorker? **clus_vir1**

The shared directory of the NetWorker server (the nsr directory) must be on a globally mounted file system.

In what path will this nsr directory be created/located?

/global/nw

Creating /usr/sbin/nsr/lcmap file ...

```
-rwxrwxr-x  1 root          1707 Aug 20 12:44 /usr/sbin/nsr/lcmap
```

Finished creating /usr/sbin/nsr/lcmap file.

resource type is not registered

Defining LGTO.clnt resource type with RGM.

resource type is not registered

Defining LGTO.serv resource type with RGM.

NetWorker has been successfully cluster-configured.

Autochanger Installation and Configuration

This chapter provides information on installing and configuring autochangers. It includes the following:

- “About Autochangers” on page 79
- “Vendor-Specific ASC and ASCQ Codes Supported in Sun StorEdge EBS Software” on page 80
- “Autochanger Configuration and Testing” on page 81
- “The `jbconfig` Command Output” on page 88

About Autochangers

Note: The term *autochanger* refers to a variety of backup devices:

- Autoloader
- Carousel
- Datawheel
- Jukebox
- Library
- Near-line storage

For more information about autochanger support by the Sun StorEdge EBS software, refer to the Legato Compatibility Guides on the Legato web site at www.legato.com.

Notes:

- Release 7.0 of the Sun StorEdge EBS software includes the ability to recognize shared drives, known as dynamic drive sharing (DDS). For more information about DDS, refer to the *Sun StorEdge Enterprise Backup Software Administrator's Guide*.
- To install and configure Sun StorEdge EBS support for Network Data Management Protocol (NDMP), refer to the *Sun StorEdge Enterprise Backup Software Administrator's Guide*.



Caution – For all tape devices used with Sun StorEdge EBS software, ensure that the block size mode specified in the operating system is set to *variable*. Otherwise, data recovery may fail. For information about setting the tape device block size mode through the operating system, refer to the operating system documentation.

- The Sun StorEdge NetWork Foundation HBA/Driver requires a special configuration to bind the device World Wide Port Names that are used by the Legato lus driver. For information explaining how to configure the Sun StorEdge NetWork Foundation HBA/Driver, refer to the *Sun StorEdge Enterprise Backup Software Administrator's Guide*.

Vendor-Specific ASC and ASCQ Codes Supported in Sun StorEdge EBS Software

Release 7.0 of the Sun StorEdge EBS software automatically installs the Additional Sense Code (ASC), ascd code, and vendor-specific directories when the server or storage node is installed. This ascd code utility translates standard SCSI and many vendor-specific ASC and Additional Sense Code Qualifiers (ASCQ) into English error messages.

The ASC/ASCQ utility is located in the Sun StorEdge EBS driver package. Since the driver package is in the storage node, the utility is automatically installed with the server and storage node. If you install only the client package, the ASC utility is not installed.

Autochanger Configuration and Testing

This section provides instructions on how to configure and test the device driver software on a Sun StorEdge EBS server or storage node with an attached autochanger. For more information on configuring an autochanger, refer to the *Sun StorEdge Enterprise Backup Software Administrator's Guide*.

To use an autochanger for Sun StorEdge EBS storage management, follow the procedures for these tasks:

- [“To Configure The Autochanger” on page 82](#)
- [“To Test The Autochanger Connection” on page 87](#)

Use the `inquire` command to make sure the device is detected or to gather the information necessary to configure the autochanger with `jbconfig`. The `inquire` command displays a list of all SCSI and Fibre Channel devices attached to the server. In a large SAN environment, you can use the `inquire` command to determine which SCSI addresses are available to use with the autochanger before you physically attach it.

Note – The `inquire` command has changed. The `inquire` command in Sun StorEdge EBS release 7.0 displays the serial number of the devices; the earlier version of `inquire` displayed the list of devices without serial number information. If you are running scripts that use the `inquire` command, they could be broken by this change; use the `-s` option with the `inquire` command to suppress serial number identification and use the original format.

The `inquire` command in Sun StorEdge EBS release 7.0 displays a list of attached devices, as shown in the following example

```
scsidev@0.0.0:SEAGATE ST34371W SUN4.2G7462 | Disk,  
/dev/rdisk/c0t0d0s2  
  
S/N: JDY217500LUW5N  
  
scsidev@0.1.0:QUANTUM ATLAS IV 36 SCA 0B0B | Disk,  
/dev/rdisk/c0t1d0s2  
  
S/N: 363009430963  
  
ATNN:QUANTUM 363009430963
```

```

scsidev@0.6.0:TOSHIBA XM5701TASUN12XCD2395 | CD-ROM,
/dev/rdisk/c0t6d0s2

scsidev@4.0.0:IBM      ULTRIUM-TD1      0CE0 | Tape, /dev/rmt/0cbn
                               S/N: 6811003960
                               ATNN:IBM ULTRIUM-TD1 6811003960
                               WWNN:502342877745333C

scsidev@4.1.0:IBM      ULTRIUM-TD1      0CE0 | Tape, /dev/rmt/1cbn
                               S/N: 6811004028
                               ATNN:IBM ULTRIUM-TD1 6811004028
                               WWNN:502342877745328A

scsidev@4.2.0:EXABYTE Exabyte 220      2.4 | Autochanger (Jukebox)
                               S/N: 99999999
                               WWNN:1234567812345678

scsidev@4.3.0:HP      Ultrium 1-SCSI   N23D | Tape, /dev/rmt/2cbn
                               S/N: GB81A00316
                               ATNN:HP Ultrium 1-SCSI
                               GB81A00316

```

▼ To Configure The Autochanger

To configure the autochanger:

1. Make sure the autochanger is connected.
2. Log in as root on the Sun StorEdge EBS server.

3. Enter the `inquire` command. The `inquire` command for the Solaris platform is:

```
# /usr/sbin/nsr/inquire
```

The `inquire` command allows you to verify that the autochanger is attached, and to determine the following information about the robotics and tape drives:

- SCSI address
- Vendor and model
- Firmware
- Device type and pathname
- Serial number

Note: If `inquire` does not display the device pathname, there are several possible causes:

- The computer might need to be rebooted.
- The cabling or hardware configuration might be incorrect.
- The device driver might not be installed. Contact the vendor to obtain the driver.

For more information about the `inquire` command, refer to the `inquire(1m)` man page.

4. Run the `sjisn` command with the SCSI address of the autochanger you want to configure:

```
# sjisn scsi_address
```

For supported autochangers, the `sjisn` command lists the drives, identified by serial number, *in the order that they occur* in the autochanger. For example, for the Exabyte 221L shown previously, enter:

```
# sjisn 4.2.0
```

The output from `sjisn` displays the serial number identification of the drives one by one, as in the following example:

```
aurora{root}8: sjisn 4.2.0

Serial Number data for 4.2.0 (EXABYTE Exabyte 221L ):
  Library:
    Serial Number: 99999999
    SCSI-3 Device Identifiers:
      WWNN:1234567812345678
  Drive at element address 82:
    Serial Number: 6811004028
    SCSI-3 Device Identifiers:
      ATNN:IBM ULTRIUM-TD1 6811004028
      WWNN:502342877745328A
  Drive at element address 83:
    Serial Number: 6811003960
    SCSI-3 Device Identifiers:
      ATNN:IBM ULTRIUM-TD1 6811003960
      WWNN:502342877745333C
```

If the `sjisn` output does not provide the serial number information, the autochanger does not support the `sjisn` command, but you can continue to use `jbconfig` to configure the autochanger.

For more information about the `sjisn` command, refer to the `sjisn(1m)` man page.

5. Verify that the Sun StorEdge EBS daemons are running by entering one of the following commands:

```
# ps -ef | grep nsr

# ps -aux | grep nsr
```

If the Sun StorEdge EBS daemons are not running, start them in the following order:

- # `nsrexecd`
- # `nsrd`
- (Optional) # `nwadmin &`

This command launches the Sun StorEdge EBS Administrator program, which should display the drives if the configuration is completed correctly.

6. Run the `jbconfig` command:

```
# jbconfig
```

The program lists the autochanger types that are supported on the platform used.

7. At the prompt, select one of the available options to indicate which type of autochanger to install. From this point on, the response from `jbconfig` varies depending on the number and type of autochangers that are attached, and the number of drives in the autochanger being configured.

If only one autochanger is attached that matches your choice, `jbconfig` automatically displays the autochanger SCSI address and pathname in response to your selection. If more than one autochanger is attached that matches your choice, a list of matching autochangers is given and you are prompted to select one of them. As soon as a particular autochanger has been selected, `jbconfig` automatically displays the autochanger pathname as shown in the following example:

```
Installing 'Exabyte' jukebox - scsidev@4.2.0.
```

8. Enter a name to assign to the autochanger at the `jbconfig` command prompt. For example:

```
What name do you want to assign to this jukebox device? Exabyte
```

9. Answer whether you want to enable autocleaning: [yes | no].
10. If all drive and pathname information is available, each drive is listed with its SCSI address and driver pathname. If there are difficulties locating the drives in the autochanger, a message explains at this point that you will have to supply the missing information later on.
11. Answer whether you want to configure any of the drives as shared or NDMP devices: [yes | no].
12. Answer whether any drive is going to have more than one path defined [yes | no]. If all drives were listed in step 10, `jbconfig` goes to step 14.
13. If drive pathname information was missing at step 10, you are prompted to enter it for each drive in question in one of the following forms

```
/dev/rmt/lcbn --for local path or
```

```
host:device-path --for remote node or
```

```
host:drive-letter:directory path --for Windows disk file
```

```
Drive x, element y
```

```
Drive path ? <somepath>
```

where **x** and **y** are supplied by `jbconfig` and **<somepath>** is supplied by you.

You can use the output from the `sjisn` command, if the autochanger supports it, to verify the serial number of the first drive in the autochanger, or to identify it if the pathname is not automatically supplied. The first drive in the autochanger is the *first drive listed* under the library in the `sjisn` output.

For example, the first drive listed in the sample output from `sjisn` in [Step 4](#) has the serial number 6811004028:

Drive at element address 82:

```
Serial Number: 6811004028
```

Use the output from the `inquire` command to identify the drive pathname of the serial number obtained from `sjisn`.

For example, the drive with serial number 6811004028 in the sample output from `inquire` (shown on [page 81](#)) is `/dev/rmt/lc1bn`.

After you have filled in the pathname as prompted, you may be asked to select a drive type number from a list of about 50 types.

The process in step 13 repeats until all unaccounted drives receive pathname information.

14. Configuration is complete.

When the configuration is complete, the following message appears:

```
Jukebox has been added successfully.
```

When you use the `jbconfig` program to configure an autochanger, a new resource is created with the name you specified. To view the:

- New jukebox resource, use the Sun StorEdge EBS Administrator program.
 - a. If the Sun StorEdge EBS Administrator program is not already running, enter the command:

```
# nwadmin &
```
 - b. From the Media menu, select Jukeboxes
- Attributes of the Jukeboxes resource, refer to the Online Help or the `nsr_jukebox(5)` man page.

For more information on the available `jbconfig` command options, refer to the `jbconfig(1m)` man page. For an example, see [“The `jbconfig` Command Output” on page 88](#).

For more information on configuring an autochanger, refer to the *Sun StorEdge Enterprise Backup Software Administrator’s Guide*.

▼ To Test The Autochanger Connection

To test the autochanger connection:

1. Log in as root on the Sun StorEdge EBS server or storage node.
2. Insert two volumes, one each into the first and last slots of the autochanger. Make sure that the drives are empty and that any drive doors are open.
3. Enter the **jbexercise** command at the prompt and specify the control port and the jukebox model. Make sure to use the same control port pathname that was used in [“To Configure The Autochanger” on page 82](#).

For example, the following command runs the **jbexercise** program on the Exabyte autochanger detected by the **jbconfig** script:

```
# jbexercise -c scsidev@4.2.0 -m "EXB-220"
```

To get the text string for the -m "model" parameter, run the **jbexercise** command without any options; this prints a list of supported models. For additional information on the command options available for the **jbexercise** command, refer to the **jbexercise(1m)** man page.

Notes:

- To list the SCSI devices that are available, use the **inquire** command. The control port for SCSI autochangers is typically expressed in the format `scsidev@n.n.n`.
- To obtain information about a standard SCSI jukebox, run the **jbexercise** command with the following options:
- # **jbexercise -m other -c <bus.target.lun>**

To obtain the exact SCSI address for the -c parameter, use output from the **inquire** command, or the response displayed by the **jbconfig** command script when the autochanger was configured:

```
Installing 'Exabyte' jukebox - scsidev@4.2.0.
```

- For additional information on the command options available for the **jbexercise** command, refer to the **jbexercise(1m)** man page.

The jbconfig Command Output

The following is an example of what would be displayed when installing an autodetected SCSI jukebox on a Solaris computer. In this case, only one autochanger, with a single drive, is attached. Output would vary in cases where:

- two or more autochangers are attached
- the autochanger has more than one drive
- the driver filepath is not detected for one or more drives in an autochanger
- prompts are answered differently than in this example

```
# jbconfig

    1) Configure an AlphaStor/SmartMedia Jukebox.

    2) Configure an Autodetected SCSI Jukebox.

    3) Configure an Autodetected NDMP SCSI Jukebox.

    4) Configure an SJI Jukebox.

    5) Configure an STL Silo.

What kind of Jukebox are you configuring? [1] 2

Installing 'HP-C1557A/Surestore 12000e' jukebox - scsidev@1.3.1.

What name do you want to assign to this jukebox device? test

Turn NetWorker auto-cleaning on (yes / no) [yes]? y

The following drive(s) can be auto-configured in this jukebox:

1> 4mm 12GB @ 1.3.0 ==> /dev/rmt/0cbn
```


These are all the drives that this jukebox has reported.

To change the drive model(s) or configure them as shared or NDMP drives, you need to bypass auto-configure.

Bypass auto-configure? (yes / no) [no] n

Jukebox has been added successfully

The following configuration options have been set:

- > Jukebox description to the control port and model.
- > Autochanger control port to the port at which we found it.
- > Networker managed tape autocleaning on.
- > Barcode reading to off because it does not appear that this jukebox has a barcode reader.
- > Slot intended to hold cleaning cartridge to 6. Please ensure that a cleaning cartridge is in that slot.
- > Number of times we will use a new cleaning cartridge to 5.
- > Cleaning interval for the tape drives to 6 months.

You can review and change the characteristics of the autochanger

```
and its associated devices using nwadmin.
```

```
Would you like to configure another jukebox? (yes/no) [no]n
```

Using the `op` Driver with Optical Devices

Solaris support for optical drives is enhanced by the Sun StorEdge EBS optical device driver `op`, which enables the use of optical disks with sectors larger than 512 bytes (1024, 2048, and 4096). After Sun StorEdge EBS is installed, the `op` driver is used with any device, attached to the Solaris system, whether a standalone device or autochanger, that "claims" to be an optical device. On system reboot with the `-r` option, the `op` driver is configured for each optical device, resulting in a device file of the form `/dev/opticalN` for each optical drive.

Because HP optical drives can run in either "disk drive" or "optical" mode, any optical drives running in disk drive mode must be reset to optical mode using the `hpflip` utility. Once the HP optical drive has been set to optical mode, the system should be rebooted so that the settings for attached devices will be reread. Use the following procedure to reset HP optical drives to optical mode.

1. Run the `inquire` command to get the SCSI address of the optical device, which will be returned in the form `scsidev@b.t.l`, where `b` is bus id, `t` is target id, and `l` is lun id.
2. Run `hpflip` as follows:

```
hpflip -a b.t.l -o
```

where `b.t.l` is the SCSI address of the optical device, as returned by the `inquire` command, and `-o` sets the specified drive to optical.

3. Reboot the computer with the `-r` option as follows, to make the changes performed by `hpflip` visible to the operating system.

```
reboot -dl -- -rv
```

Define all optical devices within Sun StorEdge EBS as optical devices.

How to Determine Device Mapping to Drives on L180/L700 Library

If your system is connected with the Sun Storage Fibre Channel host bus adapter (HBA), the **inquire** command will not provide you with accurate information about tape device file to drive mapping on the L180/L700 Library.

To determine tape device file to drive mapping on an L180/L700 library, complete the following steps:

1. Obtain the serial numbers from the front panel of the L180/L700 library:
 - a. Select Menu>main menu>drive information.
 - b. Select a drive. The serial number is displayed: Drive 0331000033518
 - c. Select Menu to once again display all drives after you have recorded the serial number for a drive.
 - d. Select the other drives as required. Record the serial numbers for each drive in the library.
2. Complete the following steps to obtain the serial number of the drive to which each device is mapped:
 - a. As root at your computer, enter the following command to display the available tape device files:

```
# ls /dev/rmt/*cbn
```

The tape device files should be displayed in the following format:

```
/dev/rmt/0cbn /dev/rmt/1cbn /dev/rmt/2cbn /dev/rmt/3cbn
```

The information you need is the base device number: 0, 1, 2

- b. Enter the following command with a specific device:

```
# luxadm inq <device_path>
```

The following information is displayed about the device, including the serial number of the drive to which it is mapped. Other information, not relevant at this time, is also displayed:

```
neptune{root}109: luxadm inq /dev/rmt/1
```

INQUIRY:

Physical Path:

/devices/pci@1f,0/pci@1/pci@1/pci@f/SUNW,qlc@4/fp@0,0/st@w50
010 4f000428e49,0:

Vendor:STK

Product:9840

Revision:1.28

Serial Number331000033518

Device type:0x1 (Tape device)

c. Repeat step b for all devices on your system.

3. Match the serial numbers you obtained in step 1 to the library's drive numbers.

Note – There is no connection between the serial numbers and the device file mapping.

Drive	Serial number	device file
0	331000033518	/dev/rmt/1
1	331000033359	/dev/rmt/0

You will use this information when you are configuring the library using the **jbconfig** program. You must enter the device paths to correspond to the order of the drives in the library. For example, the first device path you enter must correspond to Drive 0 in the L180/L700 library.

Evaluating and Licensing Sun StorEdge EBS Software

This section describes enabling and registering Sun StorEdge EBS software.

Enabler codes and authorization keys are needed to turn on the ability to use features of the software on the Sun StorEdge EBS software CD-ROMs. Each collection of Sun StorEdge EBS software and feature options is sold separately as a product and each has its own enabler code. For example, each of the following options has its own enabler code:

- Network Edition
- Autochanger Software Modules
- Storage Node
- Client connections

The following sections describe how the Sun StorEdge EBS software is ordered and used *temporarily* for evaluation purposes:

- [“Temporary Use With a Built-in Enabler Code” on page 94](#)
- [“Temporary Use With an Evaluation Enabler Code” on page 94](#)

The following section describes how the Sun StorEdge EBS software is *permanently* licensed:

- [“Permanent Use With a Purchased Enabler Code, Registration, and Authorization Key” on page 95](#)

Temporary Use With a Built-in Enabler Code

You can install and use the Sun StorEdge EBS software from the media kit without entering an enabler code. A built-in temporary enabler code is in effect for 30 days after installation.

The built in enabler gives you the following functionality:

- The ability to backup to 10 client (9 clients plus the server)
- Use a tape library of up to 16 slots (storage bins)

If other functionality is needed for the evaluation period, you will need to use evaluation enablers. See the *Sun StorEdge Enterprise Backup Software Roadmap* for a list of evaluation enablers.

When you follow the installation instructions in the appropriate manual for the desired locale, the installation software notifies you that you must enter an enabler code to continue using the software beyond 30 days.

Note – If you do not enable the software within the 30 day period using either an evaluation or purchased enabler code, the ability to backup data is disabled, although restoration of data is still allowed. Any time during the initial 30-day period, you can either enter a evaluation or purchased enabler code, as described in the sections [“Temporary Use With an Evaluation Enabler Code” on page 94](#) and [“Permanent Use With a Purchased Enabler Code, Registration, and Authorization Key” on page 95](#).

Temporary Use With an Evaluation Enabler Code

You can install the Sun StorEdge EBS software and any combination of evaluation enabler codes to evaluate the Sun StorEdge EBS software for 45 days. See the *Sun StorEdge Enterprise Backup Software Roadmap* for a list of evaluation enablers.

▼ To Enter the Evaluation Enabler Code

After you follow the Sun StorEdge EBS installation instructions, perform the following procedure:

1. Obtain the appropriate enabler code for the type of Sun StorEdge EBS server and client configuration you are using.
For the appropriate enabler codes, see the *Sun StorEdge Enterprise Backup Software Roadmap* for a list of evaluation enablers.
2. Become superuser on the Sun StorEdge EBS main server or log in as a user with administrative rights.
3. Enter the following command to enable the software:

```
# nsrccap -v -c <enabler_code>
```

Note – If you do not enable the software with a purchased enabler code within the 45 day period after entering an evaluation enabler code, the ability to backup data is disabled. Restoration of data is still allowed. Any time during the 45 days after you enter an evaluation enabler, you can enter a purchased enabler code, as described in [“Permanent Use With a Purchased Enabler Code, Registration, and Authorization Key”](#) on page 95.

Permanent Use With a Purchased Enabler Code, Registration, and Authorization Key

You can purchase a license for the Sun StorEdge EBS software either at the same time that you purchase a media kit, or any time during an evaluation period. You can also purchase upgrade licenses for additional clients, database modules, and jukeboxes.

Once you have purchased your licenses, you will receive one or more enabler certificates in the mail. If this is a new purchase, you will receive an enabler code for the base software and one for each additional module. If you are upgrading or adding new functionality, you will receive an enabler for each additional module.

As described on the enabler certificate, after you enable the Sun StorEdge EBS software with the code supplied on the certificate, you must register the Sun StorEdge EBS software. Sun will then send you an authorization code, which you must enter in the registration window of the Sun StorEdge EBS Administrator program. The authorization code must be entered within 45 days of the date you entered the purchased enabler certificate.

Note – If you do not enter the permanent authorization code within the 45 day period after entering the purchased enabler code, the ability to backup data is disabled, although restoration of data is still allowed.

▼ To Enable and Register the Sun StorEdge EBS Software

1. Order licenses from Sun for the type of Sun StorEdge EBS server and client configuration you are using.

When you get the purchased enabler certificate in the mail, proceed to [Step 2](#).

2. Become superuser on the Sun StorEdge EBS main server or log in as a user with administrative rights.
3. Perform the following operations to enter the purchased enabler codes:
 - a. If you have been evaluating the Sun StorEdge EBS software and have now purchased the software:
 - Upgrade from your base evaluation enabler to your purchased base enabler by entering the following command:

```
# nsrccap -v -u base_enabler_code
```

- (Optional) Delete any remaining evaluation enablers via the Sun StorEdge EBS Administrator program (nwadmin). This will eliminate warning messages coming from expiring evaluation enablers. Add your purchased enablers for additional functionality as shown in [Step b](#).

- b. Enter the following command, once for each module:

```
# nsrccap -v -c enabler_code
```


4. Start the Sun StorEdge EBS Administrator program:

```
# nwadmin &
```

5. Select View>Tabular.

6. Select Server>Registration.

The registration window lists all enabled modules by name, serial number, hostid, the expiration date, and the enabler's authorization key. If an enabler is authorized, no expiration date is shown. If an enabler is not authorized, no authorization key is shown.

7. Enter the required information in the fields for the following:

- Name
- Company
- Address
- Phone number
- Email
- Date purchased

1. With the registration information from [Step 6](#) available, call the license center at 1-800-usa4sun or send email to license@sun.com.

To send email, copy and paste the registration window contents (enabler codes, hostids, and expiration dates) along with your name, company name, address, phone number, email address and date of purchase into an email message. Include a brief note stating that you are requesting authorization keys.

The authorizations keys are returned within two days by the same method you use to request them.

Note – If you do not enter an authorization key within the 45 day period after entering the purchased enabler code, the ability to backup data is disabled. Restoration of data is still allowed.

▼ To Enter the Permanent Authorization Code

To enter the permanent authorization code for Sun StorEdge EBS servers and clients:

1. Apply for the authorization key from the Sun license center, as described in [“To Enable and Register the Sun StorEdge EBS Software”](#) on page 96.

When the authorization keys arrive, proceed to [Step 2](#).

2. Become superuser on the Sun StorEdge EBS main server or log in as a user with administrative rights.
3. Start the Sun StorEdge EBS Administrator program:

```
# nwadmin&
```

4. Select Server>Registration.
5. Enter each authorization key into the Authorization Key field for the corresponding enabler.

For example, if you have enabled and obtained the authorization key for the Autochanger Software Module, enter the authorization key into the entry for the Autochanger Software Module enabler.

Update Enablers

If you have an enabler for an earlier release of the StorEdge Backup software and are installing this release as an update, you received the "Update for Sun StorEdge EBS 7" update enabler code on the Enabler Certificate. The update enabler brings forward all the licenses for which you've already been authorized. Enter the update enabler code as you would any other enabler code. Enter the update enabler code without removing any of the previously authorized codes.

Index

A

autochanger
 configuring, 82
 testing, 87

B

backups
 clusters
 requirements, 46

C

client
 about, 18
 file indexes, 41
 recommendations
 installing, 23
 requirements
 system, 23
 uninstalling, 37

clients
 cluster, 44

clusters
 clients, 44
 configuration, 45
 defined, 44
 nodes, 44
 requirements, 46
 server, 44

commands

 inquire, 83
 jbexercise, 87
 mminfo, 40
 nsr_shutdown, 35, 37
 nwadmin, 33
 pkgadd, 31

 configuring
 autochanger, 82

D

daemons
 nsr_shutdown, 41
 nsrck, 41
 nsrexecd, 35
 shut down, 37
 starting, 36

device mapping, 91

devices supported, 19

directory default locations, 25

E

enabler codes, 19

I

inquire command, 83

installing
 guidelines, server, 24

- recommendations
 - client, 23
- software, 25
- Sun Cluster, 43
- Sun StorEdge EBS, 21
- to default locations, 27
- to nondefault locations, 30
- verifying, 32

J

- jbexercise command, 87

M

- man pages
 - uninstalling, 38
- mapping drives, 91
- mminfo command, 40

N

- nsr_shutdown command, 35, 37
- nsr_shutdown daemon, 41
- nsrck daemon, 41
- nsrexecd daemon, 35
- nwadmin command, 33

P

- pkgadd command, 31

S

- scripts
 - restart script, 41
- server
 - about, 18
 - installing guidelines, 24
 - system requirements, 24
 - uninstalling software, 37
- servers
 - clusters, 44

- software
 - ensuring startup, 32
 - uninstalling, 36
 - client, 37
 - device driver, 37
 - server, 37
 - storage node, 37
- storage node
 - about, 18
 - uninstalling software, 37
- Sun Cluster
 - installing, 43
- Sun StorEdge EBS
 - about, 17
 - client, 18
 - server, 18
 - storage node, 18
 - distribution, 17
- system requirements
 - client, 23
 - server, 24

T

- test backup, 33
- testing
 - autochanger, 87
 - installation, 33

U

- uninstalling
 - man pages, 38
 - software, 36
 - all packages, 36
 - client, 37
 - server, 37
 - storage node, 37
- updating from a previous release, 39
 - automatic conversion, 39, 40

V

- verifying installation, 32, 33
- virtual servers. See clusters