



Sun StorEdge™ Enterprise Backup Software 7.1

Installation Guide

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Preface

The *Sun StorEdge Enterprise Backup Software 7.1 Installation Guide* provides instructions on how to install Sun StorEdge Enterprise Backup™ software.

After you install the Sun StorEdge Enterprise Backup, refer to the *Sun StorEdge Enterprise Backup 7.1 Administrator's Guide* and the program's online help for detailed instructions on how to configure, administer, and use the Sun StorEdge Enterprise Backup.

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 7.1 Administrator's Guide*
- *Sun StorEdge Enterprise Backup 7.1 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>Sun StorEdge Enterprise Backup Software 7.1 Administrator's Guide</i>	817-3216-10
Release Notes	<i>Sun StorEdge Enterprise Backup Software 7.1 Release Notes</i>	817-3218-10

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Introduction

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

- [“About the Sun StorEdge Enterprise Backup Product” on page 1](#)
- [“Supported Devices” on page 3](#)
- [“Enabler Codes” on page 3](#)
- [“Related Documentation” on page 4](#)

About the Sun StorEdge Enterprise Backup Product

The Sun StorEdge Enterprise Backup 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](#).

Related Documentation

For further information about Sun StorEdge Enterprise Backup software for UNIX, refer to the following related documentation:

- *Sun StorEdge Enterprise Backup, Release 7.1, UNIX and Linux Version, Administrator's Guide*
- *Sun StorEdge Enterprise Backup, Release 7.1, UNIX and Linux Version, Release Supplement*
- *Sun StorEdge Enterprise Backup Disaster Recovery Guide*
- *Sun Command Reference Guide*
- *Legato Software Compatibility Guide*
- *UNIX man pages*

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 5](#)
- [“Installation Requirements” on page 6](#)
- [“Installing the Sun StorEdge EBS Software” on page 8](#)
- [“Verifying the Installation” on page 16](#)
- [“Uninstalling the Sun StorEdge EBS Software” on page 18](#)

Software Installation Roadmap

Use the following roadmap 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 6](#).
2. Install the required Sun StorEdge EBS software. For more information, see [“Installing the Sun StorEdge EBS Software” on page 8](#).
To update from an earlier release of Sun StorEdge EBS software, see [Chapter 3](#).
3. Install the device drivers for the Sun StorEdge EBS server and any storage nodes. For more information, see [Chapter 5](#).
4. 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 6
- “Storage Node” on page 6
- “Server Software” on page 7



Caution – Before installing Sun StorEdge EBS software, make sure that the operating system is up-to-date with the most recent 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 Administrator's Guide, UNIX and Linux Version*.

Client Software

The Sun StorEdge EBS client software package temporarily requires 35 MB of free space on the client computer.

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.
- 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 7](#)
- [“Installation Guidelines” on page 7](#)

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 8](#).
- 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 is used 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.

- Acrobat Reader software is installed 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 in the following order: 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.

[TABLE 2-1](#) lists the default locations on the server that the installation script uses, 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	/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	40 MB
Sun StorEdge EBS man pages	/usr/share/man	1 MB
Adobe Acrobat Reader	/opt/Acrobat3/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 8](#)
- [“Task 2: Install the Sun StorEdge EBS Software” on page 9](#)
- [“Task 3: Change the Sun StorEdge EBS Servers with Access to a Client” on page 14](#)

Task 1: Access the Sun StorEdge EBS Software

Access the Sun StorEdge Enterprise Backup software:

- [“To Access the Installation Files from a Local CD-ROM” on page 9](#)
- [“To Access the Installation Files from a Remote CD-ROM” on page 9](#)

▼ 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-ROM drive.
3. Locate the appropriate directory on the CD-ROM.
4. Set the PATH environment variable for user root to contain the directory where the Sun StorEdge EBS executables reside. For information on this directory, see [TABLE 2-1 on page 8](#).

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

1. On the remote system:
 - a. Insert the CD-ROM into the remote system's drive.
 - b. Mount the CD-ROM drive on the remote system.
 - c. Make the CD-ROM 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
```



Caution – Set the PATH environment variable for user root to contain the directory where the Sun StorEdge EBS executables reside. For information on this directory, see [TABLE 2-1 on page 8](#).

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 10](#)
- [“Installing to a Nondefault Location” on page 12](#)

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 10](#)
- [“To Install a Sun StorEdge EBS Storage Node” on page 10](#)
- [“To Install the Sun StorEdge EBS Server” on page 11](#)

▼ 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 Fibre 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.

▼ 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. 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 [Chapter 5](#).

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

▼ 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
```

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

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

2. 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 – Start the Sun StorEdge EBS daemons *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)

3. Start the Sun StorEdge EBS daemons.

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

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

5. 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
```

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 8](#).



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.

Task 3: Change 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. 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 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.



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 recovery to the client
-

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.

Task 4: Start the Sun StorEdge EBS Daemons

The Sun StorEdge EBS daemons must be started after the installation procedure.

1. Start the Sun StorEdge EBS daemons:

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

2. Enter the following command at the system prompt:

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

[TABLE 2-2](#) lists the Sun StorEdge EBS daemons that should be running.

TABLE 2-2 Sun StorEdge EBS Daemons

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

Note – The Sun StorEdge EBS daemon **nsrmmmd** is only present if one or more devices are enabled.

Verifying the Installation

The following sections provide information about verifying the installation:

- [“Ensuring the Sun StorEdge EBS Software Starts” on page 16](#)
- [“Performing a Test Backup” on page 17](#)

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 Administrator's Guide, UNIX and Linux Version*.
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 Clients menu, select 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 text box 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 Administrator's Guide, UNIX and Linux Version* to determine the cause.

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 SUNWebasm
```

This removes the **SUNWebasm** 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. It includes the following sections:

- [“Introduction” on page 21](#)
- [“Conversion Requirements” on page 21](#)

Introduction

When updating to the Sun StorEdge EBS release 7.1 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 are updated to the current Sun StorEdge EBS release, 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 7.1 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 22](#)
- [“Task 2: Update the Sun StorEdge EBS Software” on page 22](#)
- [“Task 3: Enable and Register the Software” on page 24](#)

Task 1: Prepare to Update the Sun StorEdge EBS Software

To prepare to update the Sun StorEdge EBS software:

1. Determine whether all criteria to complete the index conversion is met. See [“Conversion Requirements” on page 21](#).

2. Back up all client file indexes and generate a bootstrap for the server.

If no current bootstrap and backup of all client file indexes exists, 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 to be backed 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 18](#).

3. Install the new release of the Sun StorEdge EBS software. For more information, see [“Installing the Sun StorEdge EBS Software” on page 8](#).



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.

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 release 7.1 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.

Task 3: Enable and Register the Software

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

Installing Sun StorEdge EBS Software in a Sun Cluster Version 3.0 or 3.1 Environment

This chapter explains how to install Sun StorEdge EBS software in a Sun Cluster version 3.0 or 3.1, environment. It includes the following sections:

- [“Cluster Concepts and Terminology” on page 25](#)
- [“Installation Requirements” on page 28](#)
- [“Updating from a Previous Release of Sun StorEdge EBS Software” on page 31](#)
- [“Installing Sun StorEdge EBS Software in a Cluster” on page 32](#)
- [“Configuring an External Client to a Virtual Server” on page 55](#)
- [“Defining Ownership of a Raw Partition for Virtual Clients” on page 56](#)
- [“Uninstalling the Sun StorEdge EBS Software” on page 56](#)
- [“Sun StorEdge EBS Cluster Script” on page 57](#)

A Sun Cluster system enables applications to be run and administered as highly available resources (data services). For detailed information about Sun Cluster 3.0 or 3.1, 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 26](#)
- [“About Clustering” on page 26](#)
- [“Cluster-Aware and Cluster-Unaware Sun StorEdge EBS Servers” on page 28](#)

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 27](#) 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**.

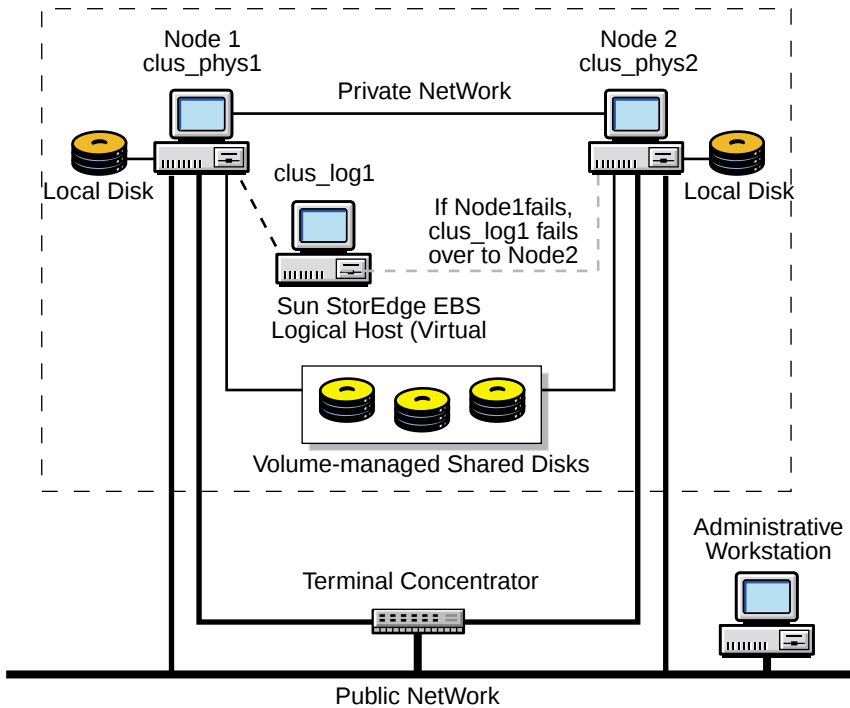


FIGURE 4-1 General Cluster Configuration

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 environment:

- “[Software Requirements](#)” on page 29
- “[Hardware Requirements](#)” on page 29
- “[Configuration Options](#)” on page 29
- “[System Information Requirements for a Highly Available Sun StorEdge EBS Server](#)” on page 29

Before proceeding, review the “[Software Installation Roadmap](#)” on page 5. 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 or 3.1
- Volume Manager software (Solstice DiskSuite/Solaris Volume Manager)

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 Administrator's Guide, UNIX and Linux Version*:

- 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 environment.

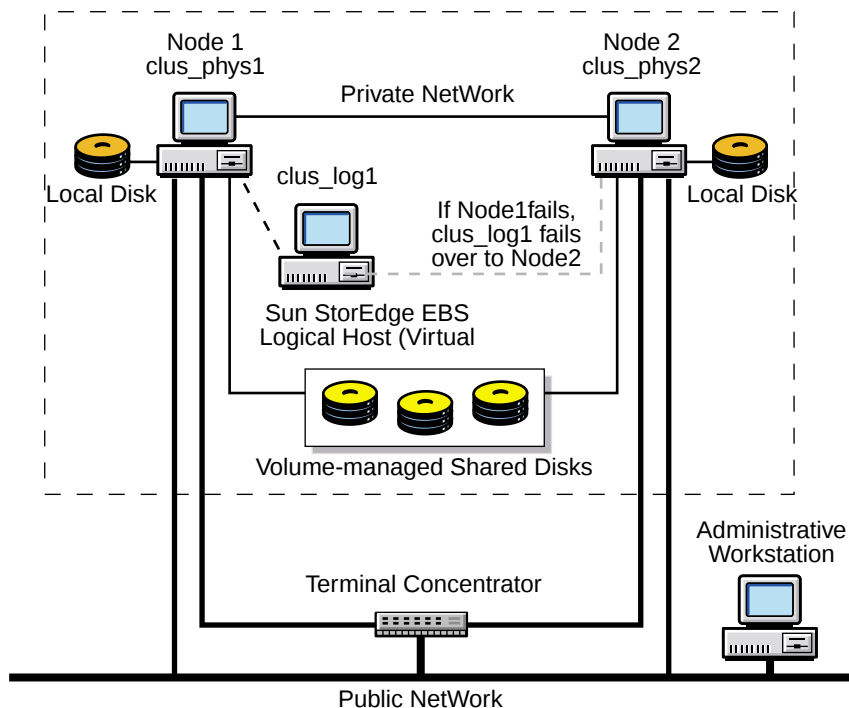


FIGURE 4-2 Sample Cluster Configuration

TABLE 4-1 Required Information: Highly Available Sun StorEdge EBS Server

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
File containing the host ID of all the cluster members	/nsr/res/hostids

Updating from a Previous Release of Sun StorEdge EBS Software

To update from Sun StorEdge EBS releases 6.1.x and 7.0 to Sun StorEdge EBS release 7.1 in a Sun Cluster 3.0 or 3.1 environment:

1. Collect the following Sun StorEdge EBS software system information:
 - The location of the Sun StorEdge EBS server global /nsr directory on the shared storage.
 - The location of the Sun StorEdge EBS client local /nsr directories.
2. List and save the cluster resource group configuration:

```
# scrgadm -pvv > scrgadm_pvv.out  
  
# scconf -pvv > scconf_pvv.out
```

3. Use Sun StorEdge EBS software to back up the cluster. Make sure that you have a recent backup of the indexes and bootstrap using the **savegrp -O** command.
4. Remove the Sun StorEdge EBS software cluster configuration files and uninstall the Sun StorEdge EBS software. Do not remove the global and local /nsr directories.

For instructions on uninstalling the Sun StorEdge EBS software, see [“Uninstalling the Sun StorEdge EBS Software” on page 56](#).

5. If required, upgrade the Sun Cluster software. For instructions, refer to the Sun Cluster documentation.
6. Install and configure the Sun StorEdge EBS 7.1 software.

Make sure that:

- You specify the same local /nsr and global /nsr directories.
- The Sun StorEdge EBS client type resource properties for **Owned_paths** and **Clientname** are the same as before the upgrade.
- The Sun StorEdge EBS **Config_dir** resource contains the same values as before the upgrade.
- The **Network_resources_used** property contains the same value that the **Resource_dependencies** property had before the upgrade.

For detailed instructions on installing Sun StorEdge EBS software in a Sun Cluster environment, see [“Installing Sun StorEdge EBS Software in a Cluster” on page 32](#).

Installing Sun StorEdge EBS Software in a Cluster

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

- [“Installing a Sun StorEdge EBS Virtual Server” on page 32](#)
- [“Installing Only the Sun StorEdge EBS Client Software in a Cluster” on page 49](#)

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 32](#)
- [“Task 2: Define the Sun StorEdge EBS Server as Highly Available” on page 34](#)
- [“Task 3: Create an Instance of the Sun StorEdge EBS Server Resource Group” on page 35](#)
- [“Task 4: \(Optional\) Add a HASToragePlus Resource to an Existing Sun StorEdge EBS Server Resource Group” on page 38](#)
- [“Task 5: Grant Access to the Highly Available Sun StorEdge EBS Server” on page 39](#)
- [“Task 6: Configure the Sun StorEdge EBS Server” on page 41](#)
- [“Task 7: Configure Clients under the Sun StorEdge EBS Server” on page 42](#)
- [“Task 8: Create Instances of the Sun StorEdge EBS Client Resource Type” on page 43](#)
- [“Task 9: Register Licenses for the Highly Available Sun StorEdge EBS Server” on page 45](#)
- [“Task 10: Authorize the Software” on page 47](#)

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 3.0 or 3.1 software are already installed on all cluster nodes and that those nodes boot in cluster mode.
 - 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, see [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 57](#).

This script defines the `LGT0.serv` and the `LGT0.cln` 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 configure 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:

- For more information, see [“System Information Requirements for a Highly Available Sun StorEdge EBS Server” on page 29](#).
- 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
- `LGT0.serv` resource
- `LGT0.clnt` resource
- `HAStoragePlus` (optional)

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 resource:

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

3. (Optional), create an instance of the `SUNW.HAStoragePlus` resource type:

- a. Determine if the HAStoragePlus resource type is registered within the cluster:

```
# scrgadm -p | egrep Type
```

- b. If required, register the HAStoragePlus resource type within the cluster:

```
# scrgadm -a -t SUNW.HAStoragePlus
```

- c. Create the SUNW.HAStoragePlus resource:

```
# scrgadm -a -g networker -j hastorageplus -t SUNW.HAStoragePlus \  
-x FilesystemMountPoints=/global/clus_vir1/nw,/global/clus_vir1/space \  
-x AffinityOn=True
```

Note: For more information on the SUNW.HAStoragePlus resource and how to set up locally mounted global systems, refer to the Sun Cluster 3.0 or 3.1 documentation.

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

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

5. Create an instance of the LGTO.serv resource type:

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

6. Start the Sun StorEdge EBS resource group:

```
# 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 network_resources_used=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: (Optional) Add a HASToragePlus Resource to an Existing Sun StorEdge EBS Server Resource Group

To add a SUNW.HASToragePlus resource to an existing Sun StorEdge EBS server resource group:

1. Determine whether the HASToragePlus resource type is registered within the cluster:

```
# scrgadm -p | egrep Type
```

2. If required, register the HASToragePlus resource type within the cluster:

```
# scrgadm -a -t SUNW.HASToragePlus
```

3. Create the SUNW.HASToragePlus resource:

```
# scrgadm -a -g networker -j hastorageplus -t SUNW.HASToragePlus -x  
FilesystemMountPoints=/global/clus_vir1/nw,/global/clus_vir1/space \  
-x AffinityOn=True
```

4. Enable the HASToragePlus resource:

```
# scswitch -e -j hastorageplus
```

5. Set up a dependency for the Sun StorEdge EBS server resource on the HASToragePlus resource:

```
# scrgadm -c -j server -y Resource_Dependencies=hastorageplus
```

6. Verify that the resource dependencies are correctly set:

```
# scrgadm -pvv -j server | egrep strong
```

Task 5: 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 recovery 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 6: 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 7: 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 8: 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 and 3.1 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.cln \
-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 44
- “[Example: A Scalable Apache Web Server](#)” on page 45

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 Administrator's Guide, UNIX and Linux Version*.

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 9: 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 recovery 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 7.1, you will need a new Update for Sun StorEdge EBS 7.1 enabler. Only customers with maintenance contracts will have automatically received Update for Sun StorEdge EBS 7.1 enablers. If you do not have a maintenance contract, order appropriate licenses for the highly available StorEdge Backup server and other desired features.

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:

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

- (Optional) 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:

```
# nsrccap -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 10: 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 host ID, 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. From the Server menu, select Server Setup and then enter the following required information:

- Name
- Company
- Address
- Phone number
- E-mail
- Date purchased

4. With the registration information and the composite host ID available, contact Sun. You can either:

- Call 1-800-usa4sun
- Send e-mail to license@sun.com.

To send e-mail, copy and paste the registration window contents (enabler codes, composite host ID, and expiration dates) along with your name, company name, address, phone number, e-mail address, and date of purchase into an e-mail 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 45 days of 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. From the Server menu, select Registration.

Enter each authorization key into the Authorization Key text box 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 49](#)
- [“Task 2: Configure Sun StorEdge EBS Client Software as Highly Available” on page 50](#)
- [“Task 3: Create Instances of the Client Resource Type” on page 51](#)
- [“Task 4: Define the List of Trusted Sun StorEdge EBS Servers” on page 53](#)
- [“Task 5: Configure Clients under the Sun StorEdge EBS Server” on page 53](#)



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 operating environment and Sun Cluster 3.0 or 3.1 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:

```
# 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 (). The package temporarily requires 70 MB of free space on the client computer.
4. (Optional) Enter the appropriate option number to install the man pages, ().
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 DNS or NIS.
3. For each node in the cluster:
 - a. Run the cluster configuration script, */usr/sbin/nsr/networker.cluster*.
This script defines the LGTO.cln 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:

- For more information, see [“System Information Requirements for a Highly Available Sun StorEdge EBS Server” on page 29.](#)
- 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 and 3.1 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.cInt \
-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*:

```
# 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 back up the client
 - Perform a directed recovery 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 Administrator's Guide, Release 7.1 and Linux* .

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.clnr 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.clnr -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.clnr 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 (*SUNWebism*) and document files have no dependencies—remove them at any time.

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

```
# pkgrm SUNWebss SUNWebsn SUNWebs SUNWebsc SUNWebism
```

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 LGT0.clnt resource type with RGM.  
resource type is not registered  
Defining LGT0.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 61
- “Supported Vendor-Specific ASC and ASCQ Codes” on page 62
- “Autochanger Configuration and Testing” on page 63
- “The `jbconfig` Command Output” on page 68
- Chapter

About Autochangers

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

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

Notes:

- Release 7.0 or later 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 Administrator's Guide and Linux*.
- To install and configure Sun StorEdge EBS support for Network Data Management Protocol (NDMP), refer to the *Sun StorEdge Enterprise Backup Administrator's Guide and Linux*.



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 Legatus driver. For information explaining how to configure the Sun StorEdge NetWork Foundation HBA/Driver, refer to the *Sun StorEdge Enterprise Backup Administrator's Guide*.

Supported Vendor-Specific ASC and ASCQ Codes

In NetWorker software, the Additional Sense Code (ASC) utility, including its associated ascdcode and library, translates vendor specific ASC and Additional Sense Code Qualifier (ASCQ) error messages.

The ASC utility is located in the Sun StorEdge EBS driver package, which is a software requirement for the storage node and the server package. Requisite software is installed automatically by default, so if you elect to install the storage node, then the driver package, and thus the ASC utility, is installed automatically.

Notes:

- If you elect *not* to install the requisite software automatically, and you do not manually select drivers to install with the storage node, the storage node installation will fail.
- If you install only the client package, then the storage node package, and thus the ASC utility, is not installed.

The ASC utility translates vendor-specific error messages for the following vendors:

- ADIC
- ATL
- BHTi
- Benchmark
- Exabyte
- Fujitsu
- HP

- IBM
- Overland
- Plasmon
- Qualstar
- Quantum
- Seagate
- STK
- Tandberg

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 Administrator's Guide and Linux*.

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

- [“To Configure The Autochanger” on page 63](#)
- [“To Test The Autochanger Connection” on page 67](#)

▼ 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:
      WNN:1234567812345678
  Drive at element address 82:
    Serial Number: 6811004028
    SCSI-3 Device Identifiers:
      ATNN:IBM ULTRIUM-TD1 6811004028
      WNN:502342877745328A
  Drive at element address 83:
    Serial Number: 6811003960
    SCSI-3 Device Identifiers:
      ATNN:IBM ULTRIUM-TD1 6811003960
      WNN: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, the matching autochangers are listed and you are prompted to select one of them. As soon as you select an autochanger, `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.
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.
12. Answer whether any drive is going to have more than one path defined. 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/1cbn --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`.
- *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` is `/dev/rmt/1cbn`.

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 68](#).

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

▼ 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 63](#).

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 find the text string for the **-m model** parameter, run the **jbexercise** command without any options to obtain 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 scsidev@n.n.n -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 (1,024, 2,048, and 4,096). After Sun StorEdge EBS software is installed, the `op` driver is used with any device, attached to the Solaris system, whether a stand-alone 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 is set to optical mode, reboot the system so that the settings for attached devices are reread.

▼ To Reset HP Optical Drives

To reset HP optical drives to optical mode:

1. Run the `inquire` command to obtain the SCSI address of the optical device, which will be returned in the form `scsidev@b.t.l`, where:
 - `b` is the bus ID
 - `t` is the target ID
 - `l` is the logical unit number (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
```

4. Define all optical devices within Sun StorEdge EBS software 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

4. 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

When the Sun StorEdge EBS software is installed, it is in a temporary evaluation mode with all of the features available. This chapter explains how to enable the Sun StorEdge EBS software and features for permanent use. The chapter also describes the Sun StorEdge Enterprise Backup licensing model and provides a basic explanation of licensing for the different Sun StorEdge EBS editions, modules, and features, but it does not provide a comprehensive description of every possible licensing scenario. For specific licensing questions, contact a Sun sales representative.

The chapter includes the following sections:

- [“How Sun StorEdge EBS Software Is Licensed” on page 75](#)
- [“The Evaluation Process” on page 76](#)
- [“The Licensing Process” on page 78](#)
- [“Sun StorEdge EBS Licenses” on page 81](#)
- [“Managing Sun Licenses” on page 85](#)

How Sun StorEdge EBS Software Is Licensed

Licensing Sun StorEdge EBS software means entering enabler and authorization codes on the server for the Sun StorEdge EBS environment. Without these codes, the software or added features will not run beyond the evaluation period.

Each installation of Sun StorEdge EBS server software must be licensed with a base enabler which “turns on” the software and allows you to use a particular bundle of features, such as a specified number of clients and devices. All licensing takes place on the server: The licenses are entered and stored on the server, and the server enforces the licensing.

Base enablers come in four editions:

- Power Edition
- Network Edition
- Workgroup Edition
- Business Edition

These four editions enable varying degrees of functionality. Add-on enablers allow a broader scope of features. For more information about the editions and different functionality, see [“Sun StorEdge EBS Licenses” on page 81](#).

The Evaluation Process

Evaluating Sun StorEdge EBS software can take place in two ways:

- Evaluating a new installation of the software on a Sun StorEdge EBS server
- Evaluating Sun StorEdge EBS features on an existing Sun StorEdge EBS installation

Evaluating a New Installation

When you first install the Sun StorEdge EBS software, you can evaluate it with all the features for 30 days free without entering any codes. If 30 days is not enough, you can gain an additional 15 days by entering "grace" in the Auth Code attribute, as described in [“To Apply Grace” on page 78](#).

By the end of the evaluation period, you must purchase, enter, and authorize a base enabler to continue using the Sun StorEdge EBS software to back up data. The base enabler is the license that enables the edition purchased. To obtain a base enabler, contact either Sun Sales or a Sun Reseller. For more information about entering and authorizing the enabler, see [“The Licensing Process” on page 78](#).

To continue using some of the features that were available with the evaluation software, you may need to purchase add-on enablers, depending on the edition of base enabler you purchase. For more information about the different Sun StorEdge EBS editions and features, see [“Sun StorEdge EBS Licenses” on page 81](#).

Evaluating Features on an Existing Installation

If you are evaluating one or more Sun StorEdge EBS features on an edition of Sun StorEdge EBS software that has already been installed and enabled, you must enter a temporary enabler for each feature. The temporary enabler is valid for 45 days.

- To obtain a temporary enabler code, refer to the Contents documentation in the Legato media kit, or contact Sun Sales or a Sun Reseller.
- To enter the temporary enabler code, see [“To Enter a Temporary Enabler Code” on page 77](#).

Note – If the Business, Network, or Workgroup edition is already installed and enabled on a computer, and you want to evaluate Power Edition, Legato recommends using a different computer as a temporary Sun StorEdge EBS server for evaluation purposes.

If 45 days is not enough, you can gain an additional 15 days by entering "grace" in the Auth Code attribute.

By the end of the evaluation period, you must purchase, enter, and authorize the corresponding license enablers to continue using features you have evaluated. For instructions, see [“The Licensing Process” on page 78](#). For more information about the different Sun StorEdge EBS editions and features, see [“Sun StorEdge EBS Licenses” on page 81](#).

▼ To Enter a Temporary Enabler Code

To enter the temporary enabler code:

1. Log in as *root* or as Sun StorEdge EBS *administrator* on the Sun StorEdge EBS server.
2. Start the Sun StorEdge EBS Administrator program:

```
# nwadmin &
```

3. From the Server menu, select Registration.
The Registration window opens.
4. Click the Create button.
5. Enter the enabler code in the Enabler Code attribute.
Filling in the Comment attribute is optional.
6. Click Apply.



Caution – The temporary enabler code is valid on only one computer in a network. If you enter the same code on more than one computer in a network, a copy protection violation error occurs and the Sun StorEdge EBS server software is disabled on all Sun StorEdge EBS servers with duplicate enablers.

▼ To Apply Grace

To apply the grace period at the end of the evaluation period:

1. Perform [Step 1](#) through [Step 3](#) of the preceding procedure, “[To Enter a Temporary Enabler Code](#)” .
2. In the Registration window, enter "grace" in the Auth Code attribute; then click Apply.

The Licensing Process

To permanently use Sun StorEdge EBS software, you must purchase and enter a license enabler code, and then authorize it. This licensing process is the same for all editions of Sun StorEdge EBS software as well as for individual features. To purchase the license enabler, contact a Sun sales representative.

The license enabler code that you purchase is valid for 45 days, as a registration period. During the registration period, you must obtain and enter a corresponding authorization code.

The following sections explain how to enter and authorize the license enabler:

- [“Task 1: Enter the License Enabler Code” on page 78](#)
- [“Task 2: Obtain an Authorization Code” on page 79](#)
- [“Task 3: Enter the Authorization Code” on page 81](#)

Task 1: Enter the License Enabler Code

License enabler codes are included in either the letter announcing the updated or upgraded software, or on the Enabler Certificate you receive when you purchase a software license. This depends on whether the software purchased is a first-time purchase, or an updated or upgraded version.

Note – To save time when entering a number of licenses, enter the base enabler last. Otherwise, once a base enabler is entered, devices that do not yet have licenses entered may be disabled; those devices would have to be re-enabled manually after their licenses were installed.

To enter the license enabler code:

1. Log in as *root* or as *Sun StorEdge EBS administrator* on the Sun StorEdge EBS server.
2. Start the Sun StorEdge EBS Administrator program:

```
# nwadmin &
```

3. From the Server menu, select Registration.
The Registration window opens.
4. If the Registration list displays a temporary enabler for the product or feature being licensed, highlight the enabler and click the Delete button.
5. In the Registration window, click the Create button.
6. Enter the enabler code in the Enabler Code attribute.
Filling in the Comment attribute is optional.
7. Click Apply.

After you enter the license enabler code, you have 45 days, as a registration period, to authorize the Sun StorEdge EBS software.

Task 2: Obtain an Authorization Code

Registration of Sun StorEdge EBS software takes place by obtaining an authorization code. Obtain a unique authorization code through one of the following methods:

- [“Using the Sun Web Site”](#)
- [“By Fax or E-mail”](#)



Caution – If the software or feature is *not* authorized by the end of the 45-day registration period, the NetWorker backup function or feature is disabled. However, data that was backed up during the registration period can still be recovered from local devices.

Using the Sun Web Site

Register Sun products and obtain authorization codes online by completing a registration form on the Sun web site at *www.sun.com*. Web registration takes just a few minutes and is available 24 hours a day, 7 days a week.

An authorization code that permanently enables the Sun StorEdge EBS license will be sent by e-mail.

If you have any questions regarding software updates, contact Sun Licensing.

By Fax or E-mail

To register the software and obtain an authorization code by fax or e-mail:

1. Log in as *root* or as Sun StorEdge EBS *administrator* on the Sun StorEdge EBS server.
2. Start the Sun StorEdge EBS Administrator program:

```
# nwadmin &
```

3. Complete your contact information:
 - a. From the Server menu, select Server Setup.
 - b. Complete the contact name, company, address, phone, and e-mail information requested, and click Apply.
4. Print the registration information sheet.
 - a. From the Server menu, select Registration.
 - b. From the View menu, select Tabular.
 - c. From the File menu, select Print.
5. Send your contact information to Sun Licensing. You can either:
 - Fax the printed registration information sheet.
 - E-mail the registration information.

An authorization code that permanently enables the updated Sun StorEdge EBS software will be sent to you.

Task 3: Enter the Authorization Code

To complete the licensing process, you must enter the unique authorization code on the Sun StorEdge EBS server within 45 days of entering the license enabler code.

To enter the authorization code:

1. Log in as *root* or as *Sun StorEdge EBS administrator* on the Sun StorEdge EBS server.
2. Start the Sun StorEdge EBS Administrator program:

```
# nwadmin &
```

3. From the Server menu, select Registration.
4. In the Registration window, highlight the appropriate license.
5. In the Auth Code text box, enter the authorization code, and then click Apply.

If the authorization process is successful, the expiration date for the license displays “Authorized - No expiration date.” If the authorization is not verified in this way, contact Sun Support.



Caution – To avoid an interruption in scheduled backups if you move the Sun StorEdge EBS software from one computer to another, or to change the network address of a computer after the software is installed, you must either:

- Contact Sun Licensing to obtain a new authorization code. Sun requires the host ID of the original server as well as the new server. The host ID is displayed in the server’s Registration window.
 - Install and configure the Sun License Manager software. For more information on using the License Manager, see [“Managing Sun Licenses” on page 85](#); also refer to the *Sun License Manager Installation and Administrator's Guide, 2nd Edition*.
-

Sun StorEdge EBS Licenses

There are four different levels, or editions, of base enabler:

- Sun StorEdge EBS Power Edition — For high-demand data centers and large, complex environments

- Sun StorEdge EBS Network Edition — For high-volume, enterprise-level environments
- Sun StorEdge EBS Workgroup Edition — For branch offices and small departmental environments
- Sun StorEdge EBS Business Edition — For businesses that require a full-function, entry-level backup software that includes a bundled library module.

Each of these editions permits you to use the software for a specified number of clients and devices. These four editions also enable different degrees of parallelism and support different add-on modules, including extra client connections, devices, or features.

Multiplatform Licensing

The client connections that come with a Sun StorEdge EBS server can be used for only that server platform; a Legato NetWorker ClientPak license allows the Sun StorEdge EBS server to back up clients of different platforms. For example, the client connections accompanying a Sun StorEdge EBS server for Windows can be used only for Windows client computers; similarly, the client connections that come with a Sun StorEdge EBS server for Solaris can be used for Solaris clients only. With a Legato NetWorker ClientPak for UNIX, other UNIX platforms can be enabled for use with the Sun StorEdge EBS Server for Solaris. The Legato NetWorker ClientPak for UNIX supports all UNIX platforms; therefore, the UNIX Legato NetWorker ClientPak is sufficient for all UNIX clients backed up by a UNIX or Windows server.

Note – The Sun StorEdge EBS software treats Linux as a separate operating system, so a Legato NetWorker ClientPak for Linux is necessary to back up Linux clients by either UNIX or Windows servers.

Example: Multiplatform Licensing Schemes

A company was using a Solaris server to back up Solaris, Linux, and Windows NT clients. It needed two ClientPak licenses, one for Linux and one for Windows. The company added HP-UX and AIX clients, which required the addition of a Legato NetWorker ClientPak license for UNIX. As the company grew and needed to add a server, it added a Windows 2000 server, which backed up the Windows NT and subsequent Windows 2000 clients without requiring a Legato NetWorker ClientPak. The company also made the Solaris computer a Sun StorEdge EBS server to back up the HP-UX, Solaris, and AIX clients, using a single Legato NetWorker ClientPak for UNIX.

Update Enablers

To update existing Sun StorEdge EBS software to a major release (one that introduces important new features), an update enabler is necessary. Update enablers are required for any major Sun StorEdge EBS software upgrade from release 4.0 and later, including Sun StorEdge EBS release 7.1. To use the Legato License Manager, the Sun StorEdge EBS server must be release 5.0 or later.

With a first-time purchase of Sun StorEdge EBS software, a one-year update agreement may be included. After a year, an update enabler may be acquired with a new update agreement purchase.

Required Update Enablers

TABLE 6-1 lists the Sun StorEdge EBS releases that require update enablers.

TABLE 6-1 Sun StorEdge EBS Releases Requiring Update Enablers

Upgrade from	to 5.0	to 5.5	to 5.5.x	to 5.6	to 5.7	to 6.x	to 7.0	to 7.1
Any release prior to 5.0	yes	yes	yes	yes	yes	yes	yes	yes
5.0		yes	yes	yes	yes	yes	yes	yes
5.5			yes	yes (UNIX only)	yes (NT only)	yes	yes	yes
5.5.x				yes (UNIX only)	yes (NT only)	yes	yes	yes
5.6					NA*	yes	yes	yes
5.7						yes	yes	yes
6.0						no	yes	yes
6.x							yes	yes
* Release 5.6 is UNIX only, and Release 5.7 is Windows only.								

Additional Licenses

This section describes a few of the additional licenses required to operate some of the Sun StorEdge EBS features. For a complete list, contact a Sun sales representative.

Client Connection Licenses

Every computer to be backed up in a Sun StorEdge EBS data zone requires a client connection license, even the Sun StorEdge EBS server. The client connection license may be one of the licenses supplied with the base enabler or purchased separately. A cluster client or NDMP data server requires a special type of client connection license, as described in [“Cluster Clients” on page 84](#) or [“NDMP Licensing” on page 84](#) respectively, below.

Storage Nodes

Each storage node requires a storage node license in addition to its client connection license. A [dedicated storage node](#), which allows the storage node to back up only itself, is licensed separately.

Sun StorEdge Enterprise Backup Application Modules

Sun StorEdge EBS Application Modules are licensed on the basis of one enabler per database type host. For example, to back up the Oracle database on two hosts, two Legato NetWorker Module for Oracle enablers are required, even if the two hosts are backed up by the same server. However, if multiple database instances are running on a Sun StorEdge EBS client host, only one Legato NetWorker Module enabler is required for that one host.

Cluster Clients

For each physical node in a cluster, you must purchase a Cluster Client Connection, which takes the place of one standard client connection. To place a Sun StorEdge EBS server in a cluster, you must have Power Edition. For more information on licensing computers in a cluster, refer to the *Sun StorEdge Enterprise Backup Administrator's Guide*.

NDMP Licensing

NDMP licensing requires one NDMP Client Connection per NDMP data server. The NDMP Client Connection is valid for any supported NDMP data server. The NDMP data server does not require a standard client connection.

Managing Sun Licenses

The Sun License Manager provides centralized license management, allowing you to maintain all of an enterprise's Sun StorEdge EBS licenses from a single computer. With the License Manager, you can move Sun StorEdge EBS software from one computer to another, or change the IP address on an existing Sun StorEdge EBS server without having to reauthorize the software. The License Manager can be installed as an option during Sun StorEdge EBS software installation.

The general steps to begin implementing the License Manager are to:

1. Contact Sun Licensing to obtain bulk enabler codes.
2. Install the License Manager software.
3. Configure the License Manager and configure the Sun StorEdge EBS servers to access the License Manager for their licenses.

For details on installing and using the License Manager, refer to the *Sun License Manager Installation and Administrator's Guide, 2nd Edition*.

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