Solstice Backup™ 5.5 Installation Guide and Release Notes

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Preface

About This Guide

The *Solstice Backup 5.5 Installation Guide and Release Notes*, provides instructions on how to install the Solstice Backup® software on a SPARC™ or Intel platform computer running the Solaris™ operating system, release 2.5.1 or later.

After you install the Backup software, refer to the *Solstice Backup 5.5 Administrator's Guide*, and the program's online help for detailed instructions on how to configure, administer, and use the Backup software.

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

How This Book Is Organized

This book is organized as follows:

Chapter 1, "Release Supplement," provides inportant information about the Solstice Backup 5.5 release. You should read these notes before installing the release.

Chapter 2, "Backup Software Installation," gives the instructions for installing the Solstice Backup 5.5 release.

Introduction to Solstice Backup

The Backup software employs a client/server model to accomplish storage management tasks. One or more Backup servers provide data protection services to clients on the network.

This release of Backup includes optional software that you can use to configure storage nodes. Storage nodes manage the media that contain backed-up data, while the Backup server manages information required to administer the clients and to track and recover data.

Clients

Adding a client to the Backup server's list of systems to back up, involes these steps:

1. **Install the Backup client software appropriate for the client's operating system on the client system.**
2. **Configure a client resource appropriate for the client's operating system on the Backup server. The Backup server also requires a client resource to ensure that its client file indexes, media database, and resource files are backed up on a regular basis.**

   The Backup server provides backup and recovery services only to clients with a configured resource on the server. Refer to the `nsr(1M)` man page for a comprehensive description of the access control policies employed by the Backup server.

Storage Nodes

With Backup, you can designate a system with storage devices attached to act as storage nodes of the Backup server. Data from Backup clients that are affiliated with one or more storage nodes is sent to media in the storage node device, rather than the server's local storage devices. The Backup server maintains the client file indexes, media database, and media management policies, while the storage node takes care of data movement and storage.

To affiliate Backup clients with a storage node for backup and recovery requests, use the Backup administration program (`nwadmin` or `nsradmin`). Distributing media management tasks to other systems on the network reduces the load placed on the controlling Backup server. It also allows you to manage remote storage management tasks across a distributed enterprise network from a central location.

Supported Devices

Backup 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 Backup server or a designated storage node. To obtain the latest list of supported devices, refer to the *Backup Compatibility Guide* on the Legato web site at `www.legato.com`.

What Is Included With This Release?

The Backup software is distributed on CD-ROM or as a compressed file for evaluation that you can download electronically (see “Software Installation From a Downloaded File” on page 35). You can install the software from a CD-ROM drive that is locally attached (see “Software Installation From a Downloaded File” on page 35) or a remote CD-ROM drive elsewhere on the network (see “Software Installation From Remote CD-ROM” on page 33).

To use the Backup software indefinitely, you must purchase a *base* enabler code which is then entered on the Backup server. After the enabler is entered, you have 45 days to print and send in a registration form to Customer Service. An authorization code is returned for you to enter on the Backup server to license the software for permanent use.

The base Backup enabler code provides basic product features at one of three levels:

Backup Software Version Purchased	Features
WorkGroup Edition	Backs up and recovers data from the server and up to three client connections of the same platform.
Network Edition	• Backs up and recovers data from the server and up to nine client connections of the same platform. • Adds support for additional client connections and optional modules.
Power Edition	• Backs up and recovers data from the server and the number of client workstations of the same platform allowed by your license. • Adds support for additional clients and optional modules. • Tuned for environments with VLDB (very large database) or large filesystem applications (in the terabyte range).

Your distribution files contain the Backup software for a server, storage nodes, and clients of the same hardware platform. The distribution files also include optional software that you can activate by purchasing the respective enabler codes from Sun. If you want to back up data from clients on other operating systems and hardware platforms, contact SunSoft or your Authorized Sun Reseller to purchase the appropriate version of Solstice Backup ClientPak. To use the ClientPak software, install the appropriate client software package on your server, Backup clients, and storage nodes. Then enter the enabler code on the Backup server and send the registration form to Sun. An authorization code is returned for you to enter on the Backup server to use the ClientPak software indefinitely.

The distribution files include the following software:

- Backup server administration program and the programs used by Backup clients for the manual backup and recovery of files
- Support for additional client connections to clients of the same hardware platform as the Backup server
- Electronic versions of the Backup documentation set in portable document format (PDF) and the Backup manual (man) pages
- Adobe® Acrobat Reader used to view the Backup documentation set online

The distribution files optionally included the following software:

- Backup Storage Node module
- Backup Autochanger Software module
- Backup Silo Management module
- Backup High Speed Device Support module (available for Power Edition only)
- Backup Archive application
- Backup HSM (Hierarchical Storage Management) application (for SunOS™ and DIGITAL UNIX clients only)
- Solstice Backup X/Open Data Storage Manager Hierarchical Storage Management (XDSM HSM) application
- Backup SNMP (Simple Network Management Protocol) module

Documentation

The Solstice Backup CD-ROM includes Adobe Acrobat portable document format (PDF) versions of the following documents:

- *Solstice Backup 5.5 Administrator's Guide*
- *Solstice Backup Disaster Recovery Guide*
- *Solstice Backup 5.5 Installation Guide and Release Notes*

- *Installation Guide*s for the UNIX, Windows, Macintosh, and NetWare ClientPak software
- A copy of the latest collection of *Technical Bulletins*

Where to Find Information

The `acroread/solaris` directory on the documentation CD-ROM contains the Acrobat Reader software that is required to read the electronic documentation set. The UNIX version of Backup documentation set is located in the `Manuals/` directory on the documentation CD-ROM.

- To install and use the Acrobat Reader software on Solaris, see the following section.
- To access the documentation files, see "How to View the Backup Documentation" on page xvi.

The following programs include online help to assist you in using the software interfaces:

- The administration programs `nwadmin` and `nsradmin`
- The user programs `nwbackup`, `nwrecover`, `nwarchive`, and `nwretrieve`

The online man pages contained in the `SUNWsbum` package provide detailed information about the various programs and resources employed by the Backup software.

▼ How to Install Adobe Acrobat Reader

Use Adobe Acrobat Reader to view or print PDF versions of Backup documentation. You can copy the files from the documentation CD-ROM to local disk or view them directly from the documentation CD-ROM. The documentation CD-ROM includes Acrobat Reader software for a variety of computers. The Acrobat Reader software is also available for free download at `http://www.adobe.com`.

If you do not already have Acrobat Reader on your Solaris system, follow these steps to install the Acrobat Reader software included with Backup:

1. **Become root on the system where you want to install the Solaris version of the Acrobat Reader software.**
2. **Create a temporary directory that has at least 8 Mbytes of space available.**
3. **Insert the Solstice Backup CD-ROM into the drive and change directories to the** `acroread/solaris` **directory.**

4. **Extract the Acrobat Reader software from the** `ACROREAD.TAR` **file contained in the** `/acroread/solaris` **directory on the documentation CD-ROM.**

5. **Install the files with the following command:**

```
# ./INSTALL
```

6. **The screen clears and displays the license agreement information.**

7. **Press Return repeatedly to clear the screen until you receive the query to ACCEPT or DECLINE the license agreement.**

8. **Enter your response and press Return.**

9. **Determine where you want to install the Acrobat Reader software. The default directory is** `/opt/AcroRead`**. Enter the full pathname of an alternate location or press [Return] to accept the default.**

10. **Add the directory where you installed Acrobat Reader to the PATH environment variable.**

▼ How to View the Backup Documentation

To view the Backup documentation, follow these steps:

1. **Change to the directory that contains the document file you want to view. You can view the files directly from the CD-ROM or copy them from the following locations to your local disk:**

File on Solsticeback CD	Document
`/Manuals/disrecov.pdf`	*Solstice Backup Disaster Recovery Guide*
`/Manuals/unix/uxag.pdf`	*Solstice Backup 5.5 Administrator's Guide*
`/Manuals/unix/solig.pdf`	*Solstice Backup 5.5 Installation Guide and Release Notes*

2. **Start Acrobat Reader with the following command:**

```
% acroread file_name.pdf &
```

3. **The Acrobat Reader splash screen appears, followed by a viewing window opened for the document.**

   To use the Acrobat Reader software to print documentation from either the CD-ROM or the copied files, select Print from the File menu and specify the range of pages to print.

For a list of Acrobat Reader command line options, enter the `acroread -help` command at the shell prompt.

Year 2000 Compliance

The Backup software supports dates in the year 2000 and beyond. For additional information and details about related test cases, see the Year 2000 Compliance (Y2K) section on the Sun web site at `http://www.sun.com`.

What Typographic Changes Mean

The following table describes the typographic changes used in this book.

TABLE P-1 Typographic Conventions

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

Shell Prompts in Command Examples

The following table shows the default system prompt and superuser prompt for the C shell, Bourne shell, and Korn shell.

TABLE P-2 Shell Prompts

Shell	Prompt
C shell prompt	`machine_name%`
C shell superuser prompt	`machine_name#`
Bourne shell and Korn shell prompt	`$`
Bourne shell and Korn shell superuser prompt	#

CHAPTER 1

Release Supplement

Welcome to the Solstice Backup product. Please read the following important notes before you install the Backup software.

What's New in Release 5.5

Backup release 5.5 contains new features and improvements that are describe in this section.

New Operating System Support

This release adds support for the following operating systems:

- Solaris 7
- AIX 4.3.1 and 4.3.2
- IRIX 6.5
- Sequent DYNIX/ptx
- UnixWare 7

Support for XFS and EFS Filesystems With Backup for IRIX

Release 5.5 of Backup for IRIX supports both XFS and EFS file systems.

Saveset Consolidation for All Platforms

This release provides saveset consolidation for all supported platforms; this allows you to consolidate a new level one and the most recent full backups into an updated full.

Firewall Support

Firewall support allows administrators to configure a fixed range of service and connection ports, so that they do not have to open up large numbers of ports in the firewall to accommodate Backup software. This feature is not yet supported on Windows 98, Windows 95, Macintosh, or NetWare clients.

Server Network Interface for Recovery Operations

The administrator now has the ability to select a specific network interface card (NIC) for recovery operations. In previous releases, a specific NIC could be selected for backups only.

To specify a NIC for the client to use for Backup recover operations, use the Details option from the View menu in the Clients window to enter the name of the NIC in the Server Network Interface attribute in the resource that is set up for the client.

Automatic Detection of Rewinding Devices

Rewinding devices are automatically detected during device configuration, and an error message is displayed. This helps avoid the accidental use of rewinding devices for Backup backups.

Immediate Cloning

The immediate clone feature provides better performance for cloning operations.

Control Timeout for Storage Node Media Requests

A new attribute in the Server resource (`nsrmmd` Control Timeout) replaces the functionality previously provided by the `NSR_MMDCONTROL` environment variable. This attribute controls how long the server's `nsrd` daemon should wait for a storage node request to complete. If the timeout value is reached without the completion of the request, the operation discontinues and an error message is logged. Refer to the *Solstice Backup 5.5 Administrator's Guide* for further information.

Fixed Bugs

This section provides descriptions of bugs fixed in the 5.5 release of the Backup software.

Table 1: Customer-Reported Bugs and RFEs

Number	Description of Fixed Behavior
LGTpa00466	A hanging savegroup no longer hangs the cloning process.
LGTpa00864	The `save -E` and `save -n` commands now return correct file size estimates, even when the size is greater than 4 GB.
LGTpa01730	The name formats *group@machine_name* and *group@nt_domain_name* are now accepted in the Remote Access field of the Client resource. Previously, only *user@machine_name* was accepted.
LGTpa02963	The `save -d` *directive* command is now documented in the man pages.
LGTpa05946	The `mminfo -a` command now works as documented in the man page.
LGTpa06250	The Backup software now loads the appropriate tape after a barcode labeling operation in a silo. Use `nsrjb -l` with the `-T` option to issue more than one barcode.
LGTpa06609	Seek errors no longer occur when staging to a file type device with greater than 2.5 Gbytes.
LGTpa07887	The performance of I18N string compare is improved.
LGTpa08026	Staging now detects and skips incomplete save sets.
LGTpa08455	The `savegrp` command now succeeds at the command line with or without the verbose mode option.
LGTpa08528	Directed recover now allows you to browse a remote machine's entire index.
LGTpa08557	The Macintosh client now recognizes client names as different when they are superstrings or substrings of one another; for example, *client* and *client1*.
LGTpa08649	RPC authentication errors at backup and recovery have been fixed by changing the authentication logic and allowing more time for authentication to occur.
LGTpa08759	Backup and recover privileges are based on access rights of individual files.

Table 1: Customer-Reported Bugs and RFEs *(Continued)*

Number	Description of Fixed Behavior
LGTpa08814	The storage node installation package on UNIX now correctly includes silo support files.
LGTpa09384	Scheduled cloning now ignores savesets with dates in the future.
LGTpa09393	A hanging savegroup no longer hangs the cloning process.
LGTpa09562	Backup now correctly recognizes named pipes (does not mistake a named pipe for a mount point) to improve support for Sybase databases.
LGTpa09742	The `savepnpc` program now functions correctly on HP-UX clients.
LGTpa10034	A sporadic problem with retrieving archives on Solaris and SGI systems has been fixed.
LGTpa10186	Drive letters associated with a path when using the DOS `SUBST` command are now skipped when using `save set ALL`.
LGTpa10523	Browse and recover times now correctly reflect time zones and daylight savings time.
LGTpa10556	To improve performance, a network interface card (NIC) can now be specified for recover.
LGTpa10609	Directed recover now allows spaces in the target directory name. A directory name that includes a space must be enclosed in double quotes.
LGTpa10706	The `nsrd` daemon now caches the count of storage nodes and high speed devices to reduce CPU utilization.
LGTpa10802	For security reasons, Backup no longer relies on an industry standard portmapper; instead, Backup uses a proprietary portmapper.
LGTpa10835	The file creation date is no longer changed by the Backup recover process. Files are recovered to their original state.

Table 2: OEM- and Other Partner-Reported Bugs and RFEs

Bug ID	Description of Fixed Behavior
LGTpa02071	Time zone problems are fixed on Windows NT
LGTpa03752	The `nsr_layout` man page has been updated.
LGTpa06382	The `nsr_support` command now works on SGI IRIX and Digital UNIX.
LGTpa07978	Volume selection now considers whether an autochanger is busy or idle. (A volume in an idle autochanger is preferred.)
LGTpa08055	Authentication for administrative privileges now occurs before media management starts on cloning operations.
LGTpa08364	The BusinesSuite Module for Informix file *libbsa.so* is no longer packaged with Backup
LGTpa08455	The `savegrp` command now succeeds from the command line, with or without verbose mode.
LGTpa08649	RPC authentication errors at backup and recovery have been fixed by changing the authentication logic and allowing more time for authentication to occur.

Table 2: OEM- and Other Partner-Reported Bugs and RFEs

Bug ID	Description of Fixed Behavior
LGTpa08714	Backup performance on Windows NT is improved by writing filemarks asynchronously.
LGTpa09446	The `mminfo -r` *volid* command now returns the correct information and does not core dump when the backup was done less than 24 hours ago.
LGTpa10289	Backup enablers for HP-UX now are correctly interpreted.

Bug Fixes

Backup for UNIX release 5.5 contains several bug resolutions, including the following.

Installation Problem Using `pkgadd -R`

In the previous release, when installing the `SUUNWsbus1` package, using the `-R` option of `pkgadd`, the installation failed. This has been resolved in this release.

Documentation

Configuration, troubleshooting, and maintenance information are in the *Administrator's Guide*. The installation information is provided in the *Installation Guide*, which contains information on how to evaluate, enable, authorize, and run a test of the Backup software for your specific operating platform.

The instructions that explain how to use the graphical user interfaces provided with the `nwadmin`, `nwbackup`, `nwrecover`, `nwarchive`, and `nwretrieve` programs are in the online help.

The *Solstice Backup Disaster Recovery Guide* provides instructions to recover your server in the event of a disaster. There are separate chapters provided for each of the three server platforms that Backup supports. Chapter 1 of the *Disaster Recovery Guide* contains important information to review in order to plan and implement your disaster recovery strategy, so that you are prepared for quick recovery when a disaster occurs.

All of the Backup documentation (*Administrator's Guide*, *Disaster Recovery Guide*, *Installation Guide*, and *Release Supplement*) are provided as PDF (portable document format) files that are included with the Backup software. The Adobe Acrobat™ Reader is included for you to use to view and, optionally, print the PDF files. We recommend that you keep a printed copy of both the *Disaster Recovery Guide* and the *Installation Guide* on hand so they are readily available for reference in the event that your system is not available.

The online man pages provide documentation that describes the various programs and utilities that the Backup software uses, as well as descriptions of the resources maintained by the Backup server.

Man Pages for `nsrjb` and `jb_config`

Several changes made to the `nsrjb` and `jb_config` programs are not fully documented in their corresponding man pages. A patch is planned that will provide updated man pages with descriptions of the current syntax and behavior of these two programs.

Instructions for How to Install a Software Update

If you are installing an update to your existing Backup software, be sure to refer to the instructions provided in the Chapter 2, "Backup Software Installation," first before installing and enabling your updated software. Follow the instructions provided to remove your existing software before you install this release.

Software Patches, Compatibility Guide, and Technical Bulletins

Sun provides software patches to resolve problems encountered after a product is released. These are available from the SunSolve on the Sun web site (`http://www.sun.com`).

The Compatibility Guide lists supported devices. It is available from Legato's website at `http://www.legato.com`.

Technical Bulletins are published periodically to provide information on resolutions to any problems that are encountered and to provide additional tips about how to use the software. Your software distribution includes the complete set of Technical

Bulletins that were available at the time the product was produced. You can view new additions to Technical Bulletins from the Document Library on the Legato web site (`http://www.legato.com`).

Documentation Errata

This section provides updates to the information in your Backup documentation.

Incorrect Backup Functionality

Appendix A of the *Solstice Backup 5.5 Administrator's Guide* shows the client's `save` process contacting the storage node's `nsrmmd` process through the server's `nsrmmd` process. The diagram is incorrect: the `save` process on the Backup client directly contacts the `nsrmmd` process on the storage node. The following figure shows the correct sequence for the `save` process.

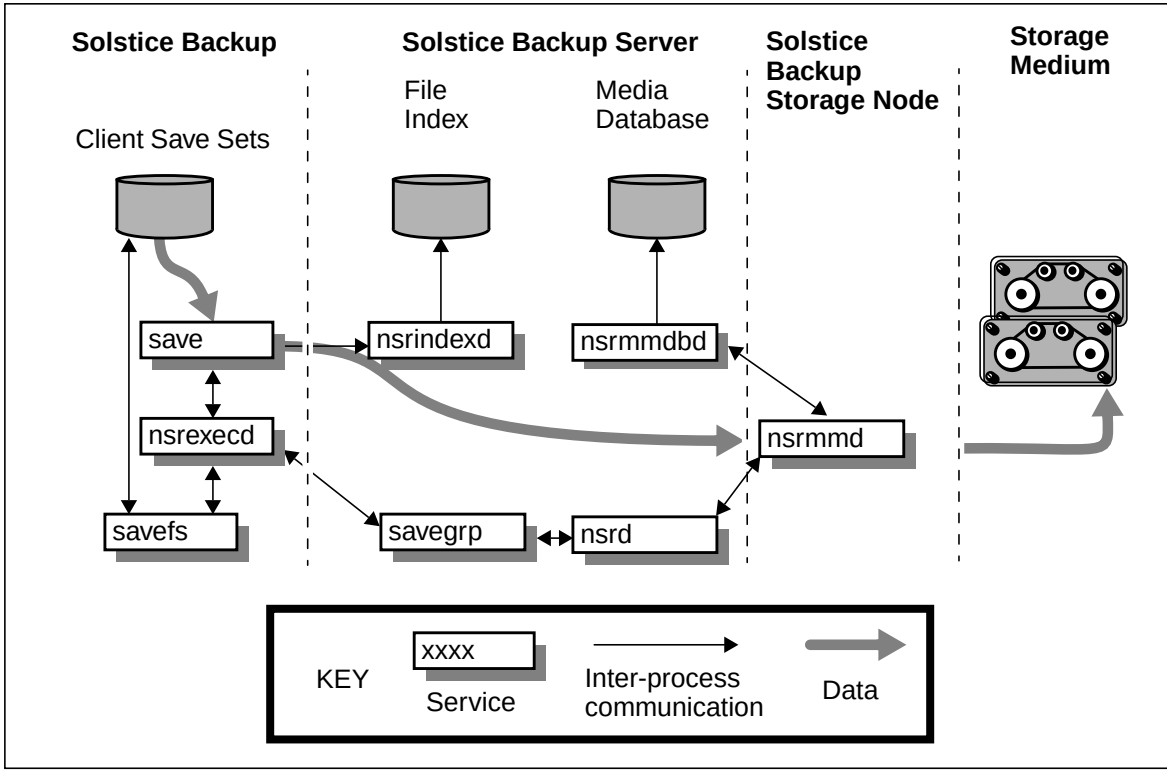

FIGURE 1-1 How Solstice Backup Daemon Processes and Programs Interact During a Save Session With a Storage Node

Important Notes and Tips

This section provides important notes and tips about your Backup software and provides recommendations, where appropriate.

Menu Changes for the `jb_config` Program

The `jb_config` program's menu contains additional choices for this release, which now appears as follows:

```
mars# jb_config
         1) Install a SmartMedia Jukebox.
         2) Install an Autodetected SCSI Jukebox.
         3) Install an SJI Jukebox.
         4) Install an RLM Jukebox.
         5) Install an STL Silo.
What kind of Jukebox are you installing? [1]
```

The default menu selection is option 1. In previous Backup releases, option 1 was assigned to "Install an Autodetected SCSI Jukebox." In this release, option 1 is now assigned to "Install a SmartMedia Jukebox."

The program choices that appear after you make your menu selection differ, based on which option you've chosen. If you accidentally accepted the default option by pressing Return, press Control-C to exit the program and restart `jb_config` again.

New Start Order for Backup Daemons

In previous releases of the Backup software, the Backup daemons were started in the following order: first `nsrd`, then `nsrexecd`. The firewall support feature in this release requires that the starting order of these daemons be reversed: first `nsrexecd`, then `nsrd`.

Base Enablers Cannot be Removed

You cannot remove the code that enables the basic Backup server software, which is referred to as a “base enabler.” A base enabler can only be upgraded (`nsrcap -u`) or downgraded (`nsrcap -d`).

Backup Power Edition Evaluation Enablers

Do not install a Power Edition evaluation enabler on your system if you already have a base enabler installed. If you do, your Backup software will cease to function properly. You can evaluate Power Edition only on a system that does not already have Network Edition or Workgroup Edition enabled.

If you elect to purchase a Network Edition or Workgroup Edition enabler for a server on which you have evaluated Power Edition, you must downgrade the evaluation enabler and enter your purchased base enabler with the following command:

```
# nsrcap -d new-base-enabler
```

New Attributes Visible in the Jukebox Resource

Several new attributes have been added to the Jukebox resource that provide a detailed view of options that the `nsrjb` program uses. These attributes are only visible when you select Details from the View menu (`nwadmin`) from the Jukeboxes window or Hidden (`nsradmin`) from the Options menu for the NSR Jukebox resource. The new attributes are described below.

- Nsrjb Release — This attribute indicates the version of the `nsrjb` program that is installed on the computer that uses the selected Jukebox resource. The version displayed for Nsrjb Release might differ from the version displayed for the Backup software on the server, depending on whether you updated your storage nodes to the same Backup release as the server.
- Jukebox Features — This attribute displays the features that your autochanger supports for use by the `nsrjb` program. If you are installing a software update, the values that were once assigned to the Jukebox Options attribute migrate to the equivalent selections for the new Jukebox Features attribute.
- Eject Sleep — This attribute defines the number of seconds an autochanger should remain idle (“sleep”) after an eject operation is completed.
- Cleaning Delay — This attribute defines the number of seconds an autochanger should remain idle before attempting to unload a cleaning cartridge.

- Unload Sleep — This attribute defines the number of seconds an autochanger should remain idle after an unload operation is completed.
- Load Sleep — This attribute defines the number of seconds a jukebox should remain idle after a load operation is completed.
- Deposit Timeout — This attribute defines the number of seconds a jukebox should wait for a deposit in the mail slot before the `nsrjb` program abandons further attempts to complete the deposit operation.

The values that appear for these new attributes are inherited from any Jukebox resources that existed when you installed the updated software. When you use the `jb_config` program to add a new Jukebox resource, the `jb_config` program automatically selects the values based on the type of autochanger you configure.

The timed settings are set by default to the optimal settings for performance. Do not change these settings unless advised to do so by a Technical Support representative.

Installing the Backup Storage Node Software

The installation of the storage node software on a computer that you want to use as a storage node depends on which one of the following scenarios fits your situation:

- You are installing the software update on an existing Backup server and storage node.
- You are installing the software for the first time on a new or existing Backup server and a new storage node.
- You are installing the software update only on the Backup server.

Caution – Do not update the computers you currently have designated as storage nodes unless you also plan to update the server. If you update a storage node but do not update the server, the updated `nsrjb` program on the storage nodes will not function with the older version of the Backup software on the server.

Installing an Update on an Existing Storage Node

If you have existing storage nodes and plan to update *both* the server and storage node software to this release, you must first install the updated software packages on the server. Once the updated software is installed on the server, you can install the software on the storage node.

After you install the software on the storage node, the Backup server's Jukebox resource configured for use by the storage node contains the new attribute values shown in Table 1-1. See "New Attributes Visible in the Jukebox Resource" on page 9 for a description of the new attributes.

TABLE 1-1 Attribute Values After Updating the Storage Node Software

Attribute	Starting Value
Nsrjb Release	Pre 5.5
Jukebox Options	Values that existed before the update
Jukebox Features	None selected
Eject Sleep[1]	Null
Cleaning Delay[1]	Null
Unload Sleep[1]	Null
Load Sleep[1]	Null
Deposit Timeout[1]	Null

1. If a value for this feature existed under the Jukebox Options attribute for the previous version, the value is transferred to the appropriate new attribute, otherwise the default value "null" is assigned.

The first time that the `nsrjb` program is run on the updated storage node, the attribute values change to those shown in Table 1-2. The values for Nsrjb Release and Jukebox Options remain the same thereafter. You can update the values for the remaining options as needed.

TABLE 1-2 Attribute Values After Updating the Storage Node Software

Attribute	Starting Value
Nsrjb Release	5.5
Jukebox Options	Null (read-only)
Jukebox Features	Selections for features that existed in Jukebox Options before the update
Eject Sleep	5
Cleaning Delay	60
Unload Sleep	5
Load Sleep	5
Deposit Timeout	600

Installing the Software on a New Storage Node

When you install the storage node software to create a new storage node, you must first update your server to the same Backup release before you run the `jb_config` program on the storage node computer to add a Jukebox resource. After you run the `jb_config` program on the storage node computer, the Jukebox resource that is created on the server displays values that the `jb_config` program automatically selects based on the type of autochanger you configure. Table 1-3 displays an example of the values that you might see.

TABLE 1-3 Attribute Values After a New Storage Node Is Created

Attribute	Starting Value
Nsrjb Release	5.5
Jukebox Options	Null (read-only)
Jukebox Features	Selections that are based on the features supported by your autochanger
Eject Sleep	5
Cleaning Delay	60
Unload Sleep	5
Load Sleep	5
Deposit Timeout	600

Installing an Update Only on the Backup Server

If you choose to update only the Backup server with the new version of the binaries contained in the storage node software package, any existing storage nodes will continue to function as usual, but they will not be able to use the benefits of the updated `nsrjb` program. After you install the software on the Backup server, the server's Jukebox resource configured for use by the storage node contains the attribute values shown in Table 1-1. These values remain until the storage node is updated to a new release of the `nsrjb` program.

Using Storage Nodes From a NetWare Client

A performance degradation is encountered when performing a backup or recover operation on a UNIX or Windows NT storage node from a NetWare client.

How to Back Up a ClearCase VOB

Technical Bulletin 306, which is found in the `bulletins.pdf` file included with your Backup software, provides a sample script that you can use as a reference to customize in order to back up a ClearCase VOB (version object base). Your customized script file must reside in the same directory as the Backup `save` program (for example, on a Solaris system, the `save` program is installed in the `/usr/sbin/nsr` directory). You enter the name of the script into the Backup Command attribute of the Client resource configured for the ClearCase VOB. During a scheduled backup, the Backup Command is invoked instead of the usual `save` program.

Caution – You must include the `save` command within your script for the backup to occur. If the script file is not in the same directory as the `save` program, the backup will fail.

Unsynchronized Client Clock Errors

If the setting for the system clock on a Backup client with Backup 5.0 client software differs from that of the Backup server by more than one minute, you receive the following message during a scheduled backup that invokes the `savegrp` program:

```
Warning: unsynchronized client clock detected
```

If the gap in synchronization is less than two minutes, you will see these errors, but the schedule is still honored. (This situation does not occur on machines with prior releases of the Backup client software installed.) To avoid this, keep the server and client clocks synchronized to within a minute of each other.

X11 Libraries Required for `jb_config`

To use the `jb_config` program on Solaris, you must have the X11 graphical libraries installed. If you attempt to run the `jb_config` program on a computer that does not have the X11 graphical libraries installed, the following error message is displayed:

```
Symbol S..... in use libvgalaxy.a is not defined
Cannot load libvgalaxy.a
System error, can not run a file.
```

Disaster Recovery Pre-Configuration

When performing a disaster recovery, some scenarios require additional configuration *prior* to performing the disaster recovery.

If you have more than one media device, you must configure that device prior to beginning the disaster recovery. The default device created by a Backup install is always a 4-mm device. If your device is not a 4-mm device, you must delete this device from within Backup and create a correct device type.

After reinstalling Backup, and before starting `mmrecov`, edit the client resource for the server and set its browse and retention policies to a decade. This allows all of the server's records to be recovered by `mmrecov`. If you do not do this, all records are recovered, but any records that are more than a month old are then discarded (since the browse policy is one month by default).

If you relocated the server's file index path to a new location, you must edit the client index path resource *prior* to beginning the disaster recovery. The correct steps are to change the index path to match the path used prior to the disaster. Restart the services to alert Backup that the index path has changed. Finally, run `nsrck -c` from the `/nsr/bin` directory to create an empty file index into which the records are recovered.

Save Set Recover on Windows NT Clients

The save set recover feature is available on Windows NT clients, but in some cases, the client user interface does not display the correct amount of disk space required for the recover. Disregard the incorrect information and proceed with the recovery.

Parallelism and Devices

The maximum value for parallelism and devices depends on the Backup product purchased and the number of enabled storage nodes, as shown in Table 1-4. Regardless of the number of enabled storage nodes, the maximum parallelism limit

for any Backup server / storage node combination can vary, so refer to the documentation for the particular server for the maximum parallelism allowed. The maximum limit for devices is 256.

TABLE 1-4 Maximum Parallelism and Device Values

Backup Product	With Each Enabled Storage Node	Without Storage Nodes
WorkGroup Edition	Feature is not available	Parallelism: 8
	Feature is not available	Devices: 2
Network Edition	Parallelism: 32 Maximum = (32 x #nodes) + 32	Parallelism: 32
	Devices: 16 Maximum = (16 x #nodes) + 16	Devices: 16
Power Edition	Parallelism: 32 Maximum = (32 x #nodes) + 64	Parallelism: 64
	Devices: 16 Maximum = (16 x #nodes) + 32	Devices: 32

Authorized Servers

If you do not name any backup servers when you are prompted for the names of authorized servers to contact the client, all backup servers will be authorized to contact the client. Failure to specify a list of one or more authorized backup servers allows any backup server to contact the client.

Multiple `nsrexec` Processes

You might notice multiple instances of the `nsrexec` process running on the Backup server during a backup. This is normal behavior and happens because one `nsrexec` process is spawned for each active save stream.

Replacement for Functional Use of `portmapper` and `rpcbind`

The functional use of `portmapper` and `rpcbind` invoked in previous releases of the Backup software has been rolled into the `nsrexecd` process. The parent `nsrexecd` now spawns a child `nsrexecd` that handles the `portmapper` functions. As a result,

you will see more than one instance of the `nsrexecd` process. In the following example, the instance of `nsrexecd` running under the process ID (PID) 20415 is the parent and the instance of `nsrexecd` running under the PID 20416 is the child:

```
jupiter# ps -ef | grep nsr
root 20429 204200 11:23:59 ? 0:00 /usr/sbin/nsrmmd -n 1
root 20415 1 0 11:23:49 ? 0:01 /usr/sbin/nsrexecd -s jupiter
root 20416 204150 11:23:49 ? 0:01 /usr/sbin/nsrexecd -s jupiter
root 20428 204200 11:23:57 ? 0:00 /usr/sbin/nsrindexd
root 20420 1 0 11:23:53 ? 0:02 /usr/sbin/nsrd
root 20446 203490 11:27:22 pts/6 0:00 grep nsr
root 20427 204200 11:23:55 ? 0:00 /usr/sbin/nsrmmdbd
jupiter#
```

The change in functionality allows the Backup processes to function in a more secure manner that does not utilize ports or protocols that are commonly used by other programs.

Device Notices

This section provides information about the devices used for Backup data operations.

Nonrewinding Device Requirement

You must use a nonrewinding device for Backup backups. Backup writes a file mark on a volume at the end of each backup. When the next backup occurs, Backup appends data to the volume based on the position of the file mark. If the device automatically rewinds the data, the file mark position is lost and the data is overwritten by the next backup; *you will be unable to recover the previous backup data at a later date*.

Depositing Volumes to Slots

A new feature incorporated into `nsrjb` enables you to specify a range of volume names already contained within the media database, instead of performing an inventory of the autochanger after depositing volumes.

To deposit a labeled volume that is a member of the Backup media database into the autochanger, specify only the name of the volumes to be deposited and not the associated port or slot number. Backup will deposit volumes starting from the first port to the first slot that is not empty, for example:

```
# nsrjb volume-name1 volume-name2 volume-name3
```

If you do not want to perform an inventory after depositing labeled volumes that are also members of the Backup media database to a jukebox, make sure the following requirements are met:

- A range of empty slots must be specified for the `-S` *slots* option. The range specified should begin with the first volume in the range of ports.
- A range of nonempty ports must be specified for the `-P` *ports* option, starting from the first port.
- If the range of volumes to be deposited does not start from the first port, then the range of ports must be specified using the `-P` option. For example:

```
# nsrjb -S slot(s) [-P port(s)] volume-name(s)
```

Depositing Volumes to Slots on a Solaris Server or Storage Node

When you use the `nsrjb -S` command to deposit a range of volumes to a range of slots in an autochanger attached to a Solaris server or storage node, the deposit does not occur if the volume names are also specified with the command. To avoid the problem, do not specify the volume names at the command line.

Using the `-o` Command Option for `nsrjb`

If you use the `-o` option twice in the same `nsrjb` command line, the first `-o` option stated will be ignored. For example, in the following example, the `-o notreadonly` task will not be executed:

```
# nsrjb -o notreadonly -o notfull -S 2
```

If you want to perform multiple `nsrjb` tasks with the `-o` option, you must enter the commands separately. For example, the commands in the previous example should be entered as follows:

```
# nsrjb -Y -o notreadonly -S n
# nsrjb -Y -o notfull -S n
```

Autochanger Reset After Configuring Backup for Use With SmartMedia

After you configure the SmartMedia server to provide media services to the Backup server and/or storage node, you must run the `nsrjb -H` command to reset the autochanger's hardware and the Backup server's media database for use with SmartMedia.

How to Obtain Support for Devices Not Supported by Solaris

If you use Solaris 2.5.1 and employ a device that is not directly supported by Sun Microsystems for use with your operating system, you can obtain a copy of a new `st.conf` file from `ftp.legato.com`. The file sets up your kernel to provide support for nominally unsupported devices on SPARC machines.

The files provided on the ftp server were checked for syntactical accuracy, but have not been through rigorous testing. Therefore, use these files at your discretion.

To obtain the `st.conf` file that is appropriate for your operating system:

1. **Log in to** `ftp.legato.com` **(as** `anonymous`**) and enter the appropriate responses at the system prompt.**
2. **Change directories to** `pub/`**Backup**`/Unix/Solaris`**.**
3. **Enter binary transfer mode.**

```
ftp> binary
```

4. **Download the file that is appropriate for your version of Solaris.**
5. **Type** `quit` **at the** `ftp>` **prompt to end the** `ftp` **session after your file has finished downloading.**

6. **Copy the downloaded file to** `/kernel/drv/st.conf`**.**

7. **As root, reboot the system with the** `halt` **command, followed by the** `boot -r` **command.**

   The kernel changes are implemented once your system reboots.

Caution – Do not uncomment the line that contains tape-driver-buffering, since the activation of the tape driver buffering feature can cause a loss of data during a tape spanning operation.

Environment Variables Needed for Emass/Grau and StorageTek Silo

For an Emass/Grau and StorageTek silo, you need to edit your startup files for Solaris, HP-UX, and AIX. The following table shows where the startup files are located in `/etc/init.d/S95networker`.

Locate the following lines in the startup file.

```
'start')
(echo  'starting Backup daemons:') > /dev/console
```

Enter the lines appropriate for your particular silo, as shown in the following table.

TABLE 1-5 Environment Variables for Emass / Grau and StorageTek Silos

Silo Model	Lines to Enter
Emass / Grau	**DAS_SERVER =** *name-of-DAS-server* **export DAS_SERVER** **DAS_CLIENT =** *name-of-system-as-defined-to-DAS-server* **export DAS_CLIENT** **DAS_MEDIUM =** *type-of-tape-drive-used* **export DAS_MEDIUM** **ACI_MEDIA_TYPE =** *type-of-tape-drive-used* **export ACI_MEDIA_TYPE** Note: For DAS_MEDIUM and ACI_MEDIA_TYPE, use one of the following values: • 3480 • OD-Thick • OD-Thin • DECDLT • 8MM • 4MM • D2 • VHS • 3590 • CD • TRAVAN • DTF • BETACAM • AUDIOTAPE
StorageTek	**CSI_HOSTNAME =** *name-of-ACSLS-system* **export CSI_HOSTNAME** **/***networker-binaries-path***/mini_el &** **/***networker-binaries-path***/ssi &**

SNMP Module

The information on Simple Network Management Protocol (SNMP) in this section supercedes Chapter 10 of the *Solstice Backup 5.5 Administrator's Guide*, which contains incorrect information.

The SNMP Module is an optional add-on module for Solstice Backup. This section addresses the following topics:

- What is SNMP?
- What Does the Solstice Backup SNMP Module Provide?

- SNMP Notification Configuration
- Backup SNMP Defaults

What Is SNMP?

SNMP is a protocol for network transactions that specifies the transfer of structured management information between SNMP managers and agents.

For detailed explanations of SNMP operation, refer to your network management software documentation.

What Does the Solstice Backup SNMP Module Provide?

The Solstice Backup SNMP Module allows communication of Solstice Backup event notifications to network management stations that comply with the SNMP standard through the SNMP *trap* mechanism. An SNMP trap is an unsolicited notification sent from the SNMP agent to the network management console.

SNMP Notification Configuration

Typically, icons representing your Solstice Backup servers are displayed on your network management console. Using your network management software, you can:

- Configure the manner of event trap notifications (for example, flashing icon or color change)
- Create new SNMP notification schemes, through the Solstice Backup server administrator program, with different priorities and events
- Track pending, alert, and other configured messages
- Separate traps into event categories, such as Error Events, Status Events, Threshold Events, Configuration Events, Application Alert Events, or All Events (See your network management software documentation for information on setting up SNMP trap templates.)

Customized Solstice Backup Notifications

You can customize Solstice Backup notifications in Solstice Backup to set priorities, specify which types of events send traps, and specify which traps are sent to specific destinations. See the *Solstice Backup 5.5 Administrator's Guide* for more information on Solstice Backup notifications and associated priority values.

Backup SNMP Defaults

The following table provides Backup-specific SNMP information.

TABLE 1-6 SNMP Information

SNMP Parameter	Backup Default
Host-name	*local_host*
Community	Public
Enterprise object ID	160 (.1.3.6.1.4.1.160)
Trap-type	1

Change the Backup *local_host* default to the name of the network management station.

Try Backup for Free

The Backup CD-ROM you received also contains binaries for other Backup products. The software license mechanism allows you to evaluate a Backup server and add-on features for 30 days, on a computer that has never had the Backup server software installed before.

If you want to evaluate add-on features on a Backup server on which you have entered permanently enabler codes, you must enter evaluation enabler codes for the features you want to evaluate. Evaluation enabler codes are special enabler codes that cannot be authorized for permanent use. Like permanent enabler codes, an evaluation enabler code can be used only once per network.

The letter you received with your software package provides evaluation enabler codes that allow you to evaluate several add-on features on your enabled Backup server for 45 days. If an evaluation enabler code is not provided for the feature you would like to evaluate, please contact Sun Sales or an authorized reseller.

Caution – A ClientPak enabler is required for backup of any client (of Backup release 5.0 or later) that is not on the same operating system as your Backup server. If you have not entered an appropriate ClientPak enabler on your Backup server, backups from your Backup client are rejected.

When you decide to purchase any additional products, contact Sun sales or an authorized reseller to obtain a permanent enabler to enable and register the additional products for permanent use.

Evaluation Enablers for Existing Backup Servers

If you want to evaluate additional features of Backup with a server that already has an enabler code entered, you must use the codes provided in the letter you received with your software package, unless you are upgrading from Backup 4.2.6. If you are upgrading from Backup 4.2.6, contact your Sun representative for enabler code information.

If you are evaluating the Backup server software for the *first* time, you do not need to enter the additional evaluation enablers to use the features. The Backup server evaluation software provides the ability to connect up to ten workstations.

You can evaluate the software, on a currently enabled Backup server with up to three storage nodes, using the evaluation enablers provided in the letter you received with your software package. The enabler for the Autochanger Software Module provides enough support to allow you to evaluate the autochanger software on the storage nodes and the server.

These evaluation enablers cannot be authorized for permanent use. They will expire 45 days after entry on the Backup server. To continue to use a feature beyond the evaluation period, you must purchase a permanent enabler code that can be registered and authorized for permanent use.

▼ How to Enter an Evaluation Enabler

To enter an evaluation enabler, do the following:

1. **Become root on your Backup server.**
2. **Type** `nwadmin` **at the command prompt to start the GUI version of the Backup administration program.**
3. **Choose Registration from the Server menu to open the Registration window.**
4. **Click the Create button.**

5. **Enter the enabler code for the feature that you want to evaluate in the Enabler Code field.**
6. **Click the Apply button to save your changes.**
7. **Repeat steps 4 through 6 for each feature that you want to evaluate.**

▼ How to Remove an Evaluation Enabler

To remove an evaluation enabler, do the following:

1. **Become root on your Backup server.**
2. **Type** `nwadmin` **at the command prompt to start the GUI version of the Backup administration program.**
3. **Choose Registration from the Server menu to open the Registration window.**
4. **Highlight the evaluation enabler code you want to remove.**
5. **Click the Delete button.**

   A dialog box appears that asks you to confirm that you intend to delete the enabler code. When you click OK, another dialog box appears that directs you to perform the deletion again to confirm the intended removal. This confirmation process helps to prevent the accidental removal of a permanent enabler.
6. **Click the Delete button again.**
7. **Click OK to perform the deletion.**
8. **Repeat steps 4 through 7 for each evaluation enabler that you want to remove.**

CHAPTER 2

Backup Software Installation

Software Installation Roadmap

The default installation program installs all the Backup software packages during a single session. You can override the default selection if you want to install only selected software.

Read the sections referenced for each procedure before you install the Backup software as follows:

1. **If you have an earlier version of the Backup software installed, you** *must* **first remove the existing Backup software before you install this release of Backup on your Backup server and clients and prepare to convert the configuration files.**

   See “Removing the Backup Software” on page 52. To update the software and indexes from an earlier release, see “How to Update From Release 5.x” on page 29, or “How to Update From Release 4.2.x” on page 30.

2. **Make the distribution files available from one of the following:**
   - Local CD-ROM (see “Software Installation From Local CD-ROM” on page 33)
   - Remote CD-ROM (see “Software Installation From Remote CD-ROM” on page 33)
   - Downloaded web file (see “Software Installation From a Downloaded File” on page 35)

3. **Install the required Backup software (**`SUNWsbuc`**,** `SUNWsbus2`**,** `SUNWsbun`**, and** `SUNWsbus1`**) on the system you want to designate as the Backup server. Before you install the Backup software on the server, read the following sections in this** *Installation Guide and Releae Notes*:
   - “Server Software Installation Requirements” on page 27

- "Example of Server Software Installation" on page 38

It is best to install all the Backup software on the server at the same time. If you choose to install only selected software packages on the server, you must install them in the following order:

a. The client software package (SUNWsbucclnt)

b. The device drivers package (SUNWsbus2)

c. The storage node software package (SUNWsbun)

d. The server software package (SUNWsbus1)

4. **Install the Backup client (SUNWsbuc) software on machines with the same operating system and hardware platform as the Backup server. You can choose to install the software locally on each client or remotely through a mounted network file system (NFS) partition. Before you install the Backup software on the clients on your network, read the following sections in this manual.**
   - "Client Software Installation Requirements" on page 28
   - "Example of Client Software Installation" on page 41

5. **If you purchased an enabler for storage node support, install the Backup client (SUNWsbuc), device driver (SUNWsbus2), and storage node (SUNWsbun) software on the machines that you want to designate as storage nodes.**

   To find the latest information about supported devices, obtain the latest *Device Support Supplement*.

6. **Configure the devices for the Backup server and storage nodes. See "How to Configure Autochanger Support" on page 47. For more detailed information, refer to the autochanger and silo chapters in the *Administrator's Guide*.**

7. **Enable and register all of your Backup products. See "How to Enable and Register the Software" on page 49.**

   The software package that contains the Backup server, clients, and storage node software, as well as the Backup man pages, is in the SOLARIS directory of the Solstice Backup CD-ROM.

   The Adobe Acrobat Reader for Solaris and PDF versions of the Backup documentation set are provided on the Documentation Suite CD-ROM.

   Installation of Acrobat Reader, PDF files, and the Backup man pages is optional. They can be installed on any of the systems on your network. You can also read them directly from the CD-ROM.

   After the Backup software is installed on the server, storage nodes, and clients, refer to the *Solstice Backup 5.5 Administrator's Guide*, for information on how to configure the software for scheduled backups. For assistance using the Backup GUI, refer to

the online help. Refer to the *Solstice Backup Disaster Recovery Guide* to learn how to use the software to recover data lost in a system disaster. The PDF versions of the *Solstice Backup 5.5 Administrator's Guide* and the *Solstice Backup Disaster Recovery Guide* are located on the Solstice Backup CD-ROM.

Server Software Installation Requirements

To install the Backup software on a Solaris server, your system must meet the following requirements:

- You need a directory on the server large enough for the Backup client and server indexes and media database (usually `/usr/nsr`). See Table 2-1, "Default Locations and Space Required for Software and Documentation Files," on page 28. The installation script checks for space and suggests one or more locations for the indexes and media database.
- You need to provide the system pathname of at least one storage device for use by the Backup server to back up and recover files. For example, `/dev/rmt/0mbn` is a valid pathname for Solaris release 2.5.1. If you do not provide a pathname at the time you install the Backup software, the default pathname shown in the installation script is assigned. If you use an optical autochanger to back up and recover data, use the raw name of the device, for example, `/dev/rdsk/c0t1d0s2`.
- If the device uses tape, it must be a nonrewinding device.
- If you elect to install the online Backup man pages, see Table 2-1 for space requirements to set up a directory (for example, `/usr/man`).
- If you elect to copy the PDF documentation files, set up a directory with as much space as indicated for PDF files in Table 2-1. If you do not already have Acrobat Reader installed, you need a directory with enough space to install the Acrobat Reader software included with the Backup distribution files.

The Backup software installation script modifies the following system files during the installation process:

- `/etc/rpc`
- `/etc/syslog.conf`

Save a copy of the original versions of these files *before* you install the software.

If you want to install only some of the available Backup software, you *must* choose the client, storage node, driver, and server packages *in that order* (choices 1, 4, and 5).

If you want to install all of the available Backup software at one time, including the device drivers and man pages, press the [Return] key for the default option (`all`) when the server installation script asks you to select a package to install.

The installation script chooses the directory locations shown in Table 2-1 if you press Return to accept the default locations.

TABLE 2-1 Default Locations and Space Required for Software and Documentation Files

Software/Documentation Files	Backup Server Default Location	Space Needed
Backup GUI program files	`/usr/bin/nsr`	23 Mbytes
Backup daemon and utility command files	`/usr/sbin/nsr`	22 Mbytes
Online client file and server indexes; media database	`/usr/lib/nsr`	2 Mbytes
Adobe Acrobat Reader	`/opt/AcroRead/bin`	8 Mbytes
Backup device drivers	`/etc/LGTOuscsi`	1 Mbytes
Backup man pages	`/usr/man`	1 Mbytes
PDF files	`optional`	Varies

Previous releases of the Backup software required temporary space equal to the software package size for the `pkgadd` process. In the current version, this temporary space is no longer required.

Client Software Installation Requirements

To request backup and recovery services from the Backup server, Backup clients must be able to access the Backup software. There are two ways a client can access the Backup software:

- Clients can have an NFS-mounted directory on the remote system where the Backup programs are located.
- Clients can have the Backup programs installed directly on their local disks.

Caution – The PATH environment variable for the user `root` on the Backup server and the user on each Backup client *must* contain the directory where the Backup executables reside (usually, `/usr/sbin/nsr` and `/usr/bin/nsr`).

If you have clients of the same hardware platform as the Backup server, use the same software to install Backup on the clients. For clients with different hardware platforms, you need to purchase and install the required client software for that platform separately. Contact Sun or your Authorized Sun Reseller for more information.

When the `pkgadd` command script asks you to select a package to install, enter `1` for the client software. Optionally, you can enter `3` to install the `SUNWsbum` package at the same time. Do *not* press the [Return] key for the default response `all`. If you purchased support for storage nodes, you can install the `SUNWsbun` and `SUNWsbus2` packages at the same time, as long as the `SUNWsbuc` package is the first package selected for installation.

To back up a Backup client over the network, the `nsrexecd` daemon must be active on the client. If you select the default answer to the queries about whether you want the Backup daemons to start once the installation is complete, the `pkgadd` installation program automatically starts `nsrexecd` after a successful installation session. Make sure that the `nsrexecd` command is in each client's start-up file to avoid errors during a scheduled backup of the client.

Storage Node Installation Requirements

A storage node contains the Backup client, storage node, and device driver software. Make sure there is enough free space to install these packages.

A storage node must have at least one SCSI storage device attached and installed according to the manufacturer's instructions.

Upgrading to Solstice Backup 5.5

The following subsections discuss how to upgrade to Solstice Backup 5.5.

▼ How to Update From Release 5.x

For your older Backup file indexes and media database to be compatible with the new indexes created with newer releases of Backup, they must first be converted.

The indexes are automatically converted the first time you start the Backup daemons. Before you install the Backup software:

1. **Make sure that you have a recent, full backup of the file indexes (`/nsr/index`), server resource files (`/nsr/res`), and media database (`/nsr/mm`).**

Caution – For automatic index conversion, make sure the amount of free disk space is double the size of your largest index. If you do not have enough free disk space, remove the indexes when you remove the Backup software, and recover and convert them according to the instructions in "How to Recover the Server Index and Media Database" on page 31.

---

2. **Remove the earlier version of Backup (but not the indexes, resource files, or media database) using the instructions in "Removing the Backup Software" on page 52.**
3. **Install the new release of the Backup software.**
4. **Enable and register your Backup software using the instructions in "How to Enable and Register the Software" on page 49. You must use the enabler code that was included in the update kit.**

▼ How to Update From Release 4.2.x

For your older Backup file indexes and media database to be compatible with the new indexes created with newer releases of Backup, they must first be converted.

The indexes are automatically converted the first time you start the Backup daemons. Before you install the Backup software:

1. **Make sure that you have a recent, full backup of the file indexes (`/nsr/index`), server resource files (`/nsr/res`), and media database (`/nsr/mm`).**
2. **Remove the earlier version of the Backup software (but not the indexes, resource files, or media database) using the instructions in "Removing the Backup Software" on page 52.**

Caution – For automatic index conversion, make sure the amount of free disk space is double the size of your largest index. If you do not have enough free disk space, remove the indexes when you remove the 4.2.x release of Backup, and recover and convert them according to the instructions in "How to Recover the Server Index and Media Database" on page 31.

---

3. **Install the new release of the Backup software.**
4. **Enable and register your Backup software using the instructions in "How to Enable and Register the Software" on page 49. You must use the enabler code that was included in the update kit.**

▼ How to Update From Release 4.1.x

In order for your older Backup file indexes and media database to be compatible with the new indexes created with newer releases of Backup, they must first be converted.

Although the indexes are automatically converted the first time you start the Backup daemons, you should use the automatic conversion when you update from older releases. Instead, the following procedure is more efficient:

1. **Before you install the Backup software, make sure that you have a recent, full backup of the file indexes (**`/nsr/index`**) and media database (**`/nsr/mm`**) available.**
2. **Issue the** `nsr_shutdown` **command at the shell prompt.**
3. **Delete the** `/nsr/mm` **and** `/nsr/index` **directories on the Backup server.**
4. **Remove the earlier version of Backup, using the instructions that were included with the software.**
5. **Install the new release of the Backup software. The Backup daemons are typically restarted by default when the installation process is completed. If you do not automatically restart the daemons after installation, you must restart them manually by entering** `nsrd` **and** `nsrexecd` **at the shell prompt.**
6. **Use the** `mmrecov` **program to recover the 4.1.x version of the server index and media database. See the following section for information on how to use the** `mmrecov` **program.**
7. **After you recover the server's 4.1.x version of the server index and media database, you can recover the remainder of the server data that includes the 4.1.x version of the client indexes, using the** `nwrecover` **program.**

   In the `nwrecover` program, select all of the files and directories *except* the server index (`/nsr/index/server-name` by default) and media database (`/nsr/mm` by default), because you already recovered them with the `mmrecov` program. Also, do not recover the resource database directory (`/nsr/res` by default) because it would overwrite your new device configurations.

▼ How to Recover the Server Index and Media Database

If you are updating from release 4.2.x and do not have free disk space equal to two times the size of your largest index, first make sure you have a current Backup backup of your existing indexes, and then remove the indexes and follow the instructions in this section.

With the new version of the Backup software installed, recover the 4.1.x previous version of the server index, media database, and configuration files from the backup media as follows:

1. **Find the bootstrap information.**

   The `mmrecov` program asks you for the bootstrap save set identification number (ssid). If you perform regularly scheduled backups that include the server, you should have a copy of the bootstrap file (either as hardcopy or an electronic file) with the name of the backup media you need and the bootstrap ssid. If you do not have this information available, you can invoke the `scanner -B` command at the shell prompt to obtain the bootstrap ssid.

2. **Retrieve the backup media that contains the most recent backup named** `bootstrap` **and load it into the server's backup device.**

3. **Use the** `mmrecov` **command to extract the contents of the bootstrap backup. The** `mmrecov` **program prompts you for the bootstrap ssid, the starting file number (if known), and the starting record number (if known).**

   If you have more than one backup device available, the `mmrecov` program also prompts you to enter the name of the device you want to use. You can press Return to accept any default values that Backup provides in each prompt.

   After the `mmrecov` program completes extraction, the following message appears:

   ```
   The on-line index for 'server-name' is now fully recovered.
   ```

   You can use Backup commands such as `nsrwatch` or `nwadmin` to watch the progress of the server during the recovery of the index and configuration files. Open a new window (shell tool) to monitor the recovery so that the `mmrecov` output is not displayed on top of the `nsrwatch` output.

   Unlike the `/nsr/index` directory, the `/nsr/res` directory containing the configuration files cannot be reliably overwritten while Backup is running. Therefore, `mmrecov` recovers the `/nsr/res` directory as `/nsr/res.R`. Copy the `/nsr/res.R` file over the existing `/nsr/res` and then delete the `/nsr/res.R` file after the recovery process is completed.

   For more information about the `mmrecov` command and examples of its output, refer to the *Solstice Backup 5.5 Disaster Recovery Guide* or the `mmrecov` man page.

Software Installation From Local CD-ROM

To install Backup on a system with a local CD-ROM drive attached, follow these steps:

1. **Become root on the system where you want to install the Backup software.**
2. **Insert the Backup CD-ROM into the drive.**
3. **Change to the appropriate directory and enter the** `pkgadd -d` **command at the system prompt.**

   For SPARC:

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

   For x86: :

```
# cd /cdrom/cdrom0/solaris/x86
# pkgadd -d .
```

   See “Example of Server Software Installation” on page 38 or “Example of Client Software Installation” on page 41 for an example of the questions asked by the `pkgadd` command script.

4. **After the installation is complete, remove the Backup CD-ROM from the drive and store it in a safe location.**

Software Installation From Remote CD-ROM

To install the Backup software on a system from a remote CD-ROM drive, follow these steps:

1. **Insert the CD-ROM in the remote system’s drive.**

2. **Mount the CD-ROM on the remote system.**
3. **Make the mounted CD-ROM on the remote system exportable through NFS.**
4. **Become root on the system where you want to install the Backup software.**
5. **Create a mount point:**

```
# mkdir /tmpmntdir
```

6. **Mount the filesystem where the CD-ROM is mounted onto the system where you want to install the Backup software:**

```
# mount remote-host:/cdrom/cdrom0 /tmpmntdir
```

7. **Enter the** `pkgadd -d` **command at the system prompt.**

   For SPARC:

```
# pkgadd -d /tmpmntdir/solaris/sparc
```

   For x86:

```
# pkgadd -d /tmpmntdir/solaris/x86
```

   See “Example of Server Software Installation” on page 38 or “Example of Client Software Installation” on page 41 for an example of the questions asked by the `pkgadd` command script.

8. **After the installation process is complete, unmount the CD-ROM:**

```
# umount remote-host:/cdrom/cdrom0
```

Software Installation to a Remote Client

To install the Backup software from a local machine to a remote client on the network, follow these steps:

1. **Insert the CD-ROM in the local system's drive.**
2. **Mount the CD-ROM on the local system.**
3. **Make the mounted CD-ROM on the local system exportable through NFS.**
4. **Enter the** `pkgadd` **command on the local system, specifying the** `d` **and** `R` **flags:**

```
# pkgadd -d /cdrom/cdrom0/solaris -R \
/net/remote-client/destination-path
```

5. **Establish a remote login session with the remote client:**

```
# rlogin remote-client
```

6. **Using the remote login session you established, start the Backup daemons on the remote client:**

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

Software Installation From a Downloaded File

This section describes how to install downloaded Backup software.

Caution – The evaluation version of Backup contains tarred and compressed versions of the Backup software distribution files. Be sure that you have adequate disk space to contain both the compressed download file (about 27 Mbytes) and the fully uncompressed files (about 78 Mbytes).

To install the Backup software from a downloaded file:

1. **On the machine where you want to install Backup, create a temporary directory to extract Backup from the downloaded evaluation file.**
2. **Change directories to the temporary directory.**
3. **Use the** `gunzip` **command to uncompress the downloaded evaluation file.**

4. **Use the** `tar -xvpBf` **command to extract the resulting tar file.**

5. **Become root on the system where you want to install the Backup software.**

6. **Enter the** `pkgadd -d` **command at the system prompt, for example:**

```
# pkgadd -d /tmpdir/solaris
```

See "Example of Server Software Installation" on page 38 or "Example of Client Software Installation" on page 41 for an example of the questions asked by the `pkgadd` command script.

7. **You can remove the extracted files and then the temporary extraction directory after the installation is complete, or save a copy of the distribution files for future reference.**

Installing Backup to Another Location

By default, the Backup software is installed in the `/usr` directory. If you have insufficient disk space on the `/usr` partition, you can relocate the `SUNWsbuc`, `SUNWsbun`, and `SUNWsbus1` packages together to a specified directory within another partition. The `SUNWsbum` package can also be relocated, although you must revise the MANPATH environment variable to include the path to the relocated man pages. The device drivers package, `SUNWsbus2`, must be installed in the default location.

To install the relocatable Backup binaries to a nondefault location, use the following procedure:

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

```
basedir=ask
```

Note that to successfully install the `SUNWsbus2` package, you will need to provide the root directory (/) as the response to the query about which package base directory to use for the installation of the device drivers.

2. **Create a directory and the subdirectories** `/bin/nsr` **and** `/sbin/nsr` **where you will install the Backup binaries, for example:**

```
# mkdir /my-path/sbin/nsr
# mkdir /my-path/bin/nsr
```

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

```
/my-path/bin/nsr:/my-path/sbin/nsr
```

4. **Run the** `pkgadd -d` **command**:

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

The following prompt appears under the processing package instance section of the script:

```
Enter path to package base directory (default: /usr) [?,q] /my-path
Using my-path as the package base directory.
```

You must enter the same base path directory for all the relocated packages.

5. **At the prompt, enter the base directory for the location of the binary.**

Make sure that you enter the same base directory for the relocated packages. If you use `pkgrm` to remove the packages at a later date, you will also need to supply the base directory you specified.

Caution – Do not relocate any of the packages if the Solstice Backup BusinesSuite Module software is also installed.

Example of Server Software Installation

In this example, the following packages are installed from a local CD-ROM device on a system named `jupiter`: the client, storage node, server, and the device driver software (required for Backup to use SCSI storage devices), and the Backup man pages. This example shows only the prompts you receive as you perform the installation, with responses shown in bold type.

```
# pkgadd -d /cdrom/cdrom0/solaris/sparc
The following packages are available:
1 SUNWsbuc Backup for Solaris (Backup/Recover) Client (sparc) 5.5.Build.13
2 SUNWsbus2 Backup for Solaris (Backup/Recover) Device Drivers (sparc)
5.5.Build.13
3 SUNWsbum Backup for Solaris (Backup/Recover) Man (sparc) 5.5.Build.13
4 SUNWsbun Backup for Solaris (Backup/Recover) Storage Node (sparc) 5.5.Build.13
5 SUNWsbus1 Backup for Solaris (Backup/Recover) Server (sparc) 5.5.Build.13
Select package(s) you wish to process (or 'all' to process all packages).
(default: all) [?,??,q]: 1 2 4 5
Processing package instance <SUNWsbuc>
Backup for Solaris (Backup/Recover) Client (sparc) 5.5.Build.13
SunSoft Systems, Inc. Backup(TM) - Release 5.5.Build.13 Copyright (c) 1990-1998,
SunSoft Systems, Inc.  All rights reserved.
This product includes software developed by the University of California,
Berkeley and its contributors.
To set up a Backup server, you need to supply a directory with enough free space
to maintain all the on-line save file indexing and media management information.
To set up a Backup storage node or client, you need to supply a directory for
the nsrexecd state file.
Below is a list of some of the filesystems, with their free space, which you
might consider:
/space                        :  679643
/opt                          :  253562
/usr                          :  175490
/                             :   86252
Directory to use for client and server information [/space/nsr]? [Return]
The nsrexecd program restricts access to a select set of Backup servers.  Please
enter the names of each computer running a Backup server that will back up this
computer, one name at a time.  If a computer has more than one network interface,
please enter each interface's name (one at a time).
Enter the first Backup server's name [no more]: jupiter
Enter the second Backup server's name [no more]: [Return]
Start Backup daemons at end of install [yes]? n
Using </usr> as the package base directory.
## Processing package information.
```

```
## Processing system information.
## Verifying disk space requirements.
## Checking for conflicts with packages already installed.
## Checking for setuid/setgid programs.
This package contains scripts which will be executed with super-user permission
during the process of installing this package.
Do you want to continue with the installation of <SUNWsbuc> [y,n,?] y
Installing Backup for Solaris (Backup/Recover) Client as <SUNWsbuc>
## Installing part 1 of 1.
[ verifying class <none> ]
## Executing postinstall script.
        Installing Backup home directory in /space/nsr
        nsr-izing system files
        nsr-izing system files
        Creating /etc/init.d/networker
        Creating /etc/rc2.d/S95networker
        Creating /etc/rc0.d/K05networker
        Completing Installation
Backup successfully installed on `jupiter'!
Installation of <SUNWsbuc> was successful.
Processing package instance <SUNWsbus2>
Backup for Solaris (Backup/Recover) Device Drivers (sparc) 5.5.Build.13
Copyright (c) 1990-1998, SunSoft Systems, Inc. All Rights Reserved.
Using </> as the package base directory.
## Processing package information.
## Processing system information.
## Verifying package dependencies.
## Verifying disk space requirements.
## Checking for conflicts with packages already installed.
## Checking for setuid/setgid programs.
This package contains scripts which will be executed with super-user permission
during the process of installing this package.
Do you want to continue with the installation of <SUNWsbus2> [y,n,?] y
Installing Backup for Solaris (Backup/Recover) Device Drivers as <SUNWsbus2>
## Executing preinstall script.
## Installing part 1 of 1.
[ verifying class <none> ]
## Executing postinstall script.
Installation of <SUNWsbus2> was successful.
Processing package instance <SUNWsbun>
Backup for Solaris (Backup/Recover) Storage Node (sparc) 5.5.Build.13
SunSoft Systems, Inc. Backup(TM) - Release 5.5.Build.13
Copyright (c) 1990-1998, SunSoft Systems, Inc.  All rights reserved.
This product includes software developed by the University of California,
Berkeley and its contributors.
The nsrexecd program restricts access to a select set of Backup servers.  Please
```

```
enter the names of each computer running a Backup server that will back up this
computer, one name at a time.  If a computer has more than one network interface,
please enter each interface's name (one at a time).
Enter the first Backup server's name [no more]: jupiter
Enter the second Backup server's name [no more]: [Return]
Start Backup daemons at end of install [yes]? n
Using </usr> as the package base directory.
## Processing package information.
## Processing system information.
## Verifying package dependencies.
## Verifying disk space requirements.
## Checking for conflicts with packages already installed.
## Checking for setuid/setgid programs.
This package contains scripts which will be executed with super-user permission
during the process of installing this package.
Do you want to continue with the installation of <SUNWsbun> [y,n,?] y
Installing Backup for Solaris (Backup/Recover) Storage Node as <SUNWsbun>
## Installing part 1 of 1.
[ verifying class <none> ]
## Executing postinstall script.
        Completing Installation
Backup successfully installed on `jupiter'!
Installation of <SUNWsbun> was successful.
Processing package instance <SUNWsbus1>
Backup for Solaris (Backup/Recover) Server (sparc) 5.5.Build.13
SunSoft Systems, Inc. Backup(TM) - Release 5.5.Build.13
Copyright (c) 1990-1998, SunSoft Systems, Inc.  All rights reserved.
This product includes software developed by the University of California,
Berkeley and its contributors.
Enter the tape or disk device(s) that are going to be used by the Backup server.
Use the no-rewind, BSD-semantics name for each tape device (i.e., use /dev/rmt/
0mbn instead of /dev/rmt/0mb).  If you do not choose a device a default device
will be created for you.
Enter device name ([Return] if no more): [Return]
Start Backup daemons at end of install [yes]? [Return]
Using </usr> as the package base directory.
## Processing package information.
## Processing system information.
## Verifying package dependencies.
## Verifying disk space requirements.
## Checking for conflicts with packages already installed.
## Checking for setuid/setgid programs.
This package contains scripts which will be executed with super-user permission
during the process of installing this package.
Do you want to continue with the installation of <SUNWsbus1> [y,n,?] y
Installing Backup for Solaris (Backup/Recover) Server as <SUNWsbus1>
## Installing part 1 of 1.
```

```
[ verifying class <none> ]
## Executing postinstall script.
        Modifying /etc/rpc
        Modifying /etc/syslog.conf
        Restarting syslog daemon
        Completing Installation
        Starting Backup daemons
Backup successfully installed on `jupiter'!
Installation of <SUNWsbus1> was successful.
```

After the software is installed, you must configure the driver software to provide support for Backup to back up data to the SCSI storage devices attached to the system (see "Device Driver Installation" on page 46).

Example of Client Software Installation

In this example, the packages that are installed on the client system named `mars` are the Backup client software and the man pages:

```
# pkgadd -d /cdrom/cdrom0/solaris/sparc
The following packages are available:
1 SUNWsbuc Backup for Solaris (Backup/Recover) Client (sparc) 5.5.Build.13
2 SUNWsbus2 Backup for Solaris (Backup/Recover) Device Drivers (sparc)
5.5.Build.13
3 SUNWsbum Backup for Solaris (Backup/Recover) Man (sparc) 5.5.Build.13
4 SUNWsbun Backup for Solaris (Backup/Recover) Storage Node (sparc) 5.5.Build.13
5 SUNWsbus1 Backup for Solaris (Backup/Recover) Server (sparc) 5.5.Build.13
Select package(s) you wish to process (or 'all' to process all packages).
(default: all) [?,??,q]: 1 3
Processing package instance <SUNWsbuc>
Backup for Solaris (Backup/Recover) Client (sparc) 5.5.Build.13
SunSoft Systems, Inc. Backup(TM) - Release 5.5.Build.13
Copyright (c) 1990-1998, SunSoft Systems, Inc.  All rights reserved.
This product includes software developed by the University of California,
Berkeley and its contributors.
To set up a Backup server, you need to supply a directory with enough free space
to maintain all the on-line save file indexing and media management information.
To set up a Backup storage node or client, you need to supply a directory for
the nsrexecd state file.
Below is a list of some of the filesystems, with their free space, which you
might consider:
```

```
/space                          :  679643
/opt                            :  253562
/usr                            :  175490
/                               :   86252
Directory to use for client and server information [/space/nsr]? [Return]
The nsrexecd program restricts access to a select set of Backup servers.  Please
enter the names of each computer running a Backup server that will back up this
computer, one name at a time.  If a computer has more than one network interface,
please enter each interface's name (one at a time).
Enter the first Backup server's name [no more]: all
Allowing access to all Backup servers.
Start Backup daemons at end of install [yes]? [Return]
This package contains scripts which will be executed with super-user permission
during the process of installing this package.
Do you want to continue with the installation of <SUNWsbuc> [y,n,?] [Return]
Installing Backup for Solaris (Backup/Recover) Client as <SUNWsbuc>
## Installing part 1 of 1.
## Executing postinstall script.
        Installing Backup home directory in /space/nsr
        nsr-izing system files
        nsr-izing system files
        Creating /etc/init.d/networker
        Creating /etc/rc2.d/S95networker
        Creating /etc/rc0.d/K05networker
        Completing Installation
Backup successfully installed on `mars'!
Installation of <SUNWsbuc> was successful.
Processing package instance <SUNWsbum>
Backup for Solaris (Backup/Recover) Man (sparc) 5.5.Build.13
SunSoft Systems, Inc.
Using </usr> as the package base directory.
## Processing package information.
## Processing system information.
## Verifying disk space requirements.
## Checking for conflicts with packages already installed.
## Checking for setuid/setgid programs.
This package contains scripts which will be executed with super-user permission
during the process of installing this package.
Do you want to continue with the installation of <SUNWsbum> [y,n,?] y
Installing Backup for Solaris (Backup/Recover) Man as <SUNWsbum>
## Installing part 1 of 1.
[ verifying class <none> ]
## Executing postinstall script.
        Creating /usr/lib/nsr/nsr_man
Installation of <SUNWsbum> was successful.
```

Caution – Note that in this example, the response of `all` to the query `Please enter the names of each system running a` Backup `server that will back up this system, one name at a time` means that *any* Backup server on the network can contact this system for backups. To restrict access, enter the host name of each Backup server separately, pressing the Return key between each entry.

Example of Storage Node Module Installation

In this example, all the software required for a storage node (the `SUNWsbuc`, `SUNWsbus2`, and SUNWsbun packages) is installed on a system named `venus` that has an autochanger attached.

After the software is installed, use the Backup administration program to add clients to the new storage node.

```
# pkgadd -d /cdrom/cdrom0/solaris/sparc
The following packages are available:
1 SUNWsbuc Backup for Solaris (Backup/Recover) Client (sparc) 5.5.Build.13
2 SUNWsbus2 Backup for Solaris (Backup/Recover) Device Drivers (sparc)
5.5.Build.13
3 SUNWsbum Backup for Solaris (Backup/Recover) Man (sparc) 5.5.Build.13
4 SUNWsbun Backup for Solaris (Backup/Recover) Storage Node (sparc) 5.5.Build.13
5 SUNWsbus1 Backup for Solaris (Backup/Recover) Server (sparc) 5.5.Build.13
Select package(s) you wish to process (or 'all' to process all packages).
(default: all) [?,??,q]: 1 2 4 5
Processing package instance <SUNWsbuc>
Backup for Solaris (Backup/Recover) Client (sparc) 5.5.Build.13
SunSoft Systems, Inc. Backup(TM) - Release 5.5.Build.13 Copyright (c) 1990-1998,
SunSoft Systems, Inc.  All rights reserved.
This product includes software developed by the University of California,
Berkeley and its contributors.
To set up a Backup server, you need to supply a directory with enough free space
to maintain all the on-line save file indexing and media management information.
To set up a Backup storage node or client, you need to supply a directory for
the nsrexecd state file.
```

```
Below is a list of some of the filesystems, with their free space, which you
might consider:
/space                       :  679643
/opt                         :  253562
/usr                         :  175490
/                            :   86252
Directory to use for client and server information [/space/nsr]? [Return]
The nsrexecd program restricts access to a select set of Backup servers.  Please
enter the names of each computer running a Backup server that will back up this
computer, one name at a time.  If a computer has more than one network interface,
please enter each interface's name (one at a time).
Enter the first Backup server's name [no more]: jupiter
Enter the second Backup server's name [no more]: [Return]
Start Backup daemons at end of install [yes]? n
Using </usr> as the package base directory.
## Processing package information.
## Processing system information.
## Verifying disk space requirements.
## Checking for conflicts with packages already installed.
## Checking for setuid/setgid programs.
This package contains scripts which will be executed with super-user permission
during the process of installing this package.
Do you want to continue with the installation of <SUNWsbuc> [y,n,?] y
Installing Backup for Solaris (Backup/Recover) Client as <SUNWsbuc>
## Installing part 1 of 1.
[ verifying class <none> ]
## Executing postinstall script.
        Installing Backup home directory in /space/nsr
        nsr-izing system files
        nsr-izing system files
        Creating /etc/init.d/networker
        Creating /etc/rc2.d/S95networker
        Creating /etc/rc0.d/K05networker
        Completing Installation
Backup successfully installed on `venus'!
Installation of <SUNWsbuc> was successful.
Processing package instance <SUNWsbus2>
Backup for Solaris (Backup/Recover) Device Drivers (sparc) 5.5.Build.13
Copyright (c) 1990-1998, SunSoft Systems, Inc. All Rights Reserved.
Using </> as the package base directory.
## Processing package information.
## Processing system information.
## Verifying package dependencies.
## Verifying disk space requirements.
## Checking for conflicts with packages already installed.
## Checking for setuid/setgid programs.
This package contains scripts which will be executed with super-user permission
```

```
during the process of installing this package.
Do you want to continue with the installation of <SUNWsbus2> [y,n,?] y
Installing Backup for Solaris (Backup/Recover) Device Drivers as <SUNWsbus2>
## Executing preinstall script.
## Installing part 1 of 1.
[ verifying class <none> ]
## Executing postinstall script.
Installation of <SUNWsbus2> was successful.
Processing package instance <SUNWsbun>
Backup for Solaris (Backup/Recover) Storage Node (sparc) 5.5.Build.13
SunSoft Systems, Inc. Backup(TM) - Release 5.5.Build.13
Copyright (c) 1990-1998, SunSoft Systems, Inc.  All rights reserved.
This product includes software developed by the University of California,
Berkeley and its contributors.
The nsrexecd program restricts access to a select set of Backup servers.  Please
enter the names of each computer running a Backup server that will back up this
computer, one name at a time.  If a computer has more than one network interface,
please enter each interface's name (one at a time).
Enter the first Backup server's name [no more]: jupiter
Enter the second Backup server's name [no more]: [Return]
Start Backup daemons at end of install [yes]? n
Using </usr> as the package base directory.
## Processing package information.
## Processing system information.
## Verifying package dependencies.
## Verifying disk space requirements.
## Checking for conflicts with packages already installed.
## Checking for setuid/setgid programs.
This package contains scripts which will be executed with super-user permission
during the process of installing this package.
Do you want to continue with the installation of <SUNWsbun> [y,n,?] y
Installing Backup for Solaris (Backup/Recover) Storage Node as <SUNWsbun>
## Installing part 1 of 1.
[ verifying class <none> ]
## Executing postinstall script.
        Completing Installation
Backup successfully installed on `venus'!
```

After the software is installed on the new storage node, you must configure the driver software to provide support for Backup to back up data to any SCSI storage devices attached to the system. See "Device Driver Installation" on page 46.

■

Device Driver Installation

The term “autochanger” is used in the following instructions to refer to a variety of backup devices: autoloader, carousel, library, near-line storage, datawheel, and jukebox.

The Backup software supports autochangers connected to a computer you designated as a server or storage node, either by SCSI or serial (RS-232) ports. If your autochanger is connected with SCSI, you *must* install a driver for the SCSI port.

If your autochanger is connected through a serial port, you do not need to install the device driver package. Simply skip the remaining instructions that apply to the device driver installation. However, you need to follow the hardware instructions that were shipped with your autochanger to configure and connect the machine to the Backup server or storage node. You must also properly enable and register your Backup Autochanger Module product.

▼ How to Install the Device Driver Software

To install the device driver software on the system with the device attached:

1. **Become root on the Backup server or storage node machine.**
2. **If you have a previous release of the Backup device driver package installed, remove the old device driver package before you install the new driver.**

   See “Removing the Backup Software” on page 52 for instructions.
3. **Install the current release of the device driver software (`SUNWsbus2`) from the Backup distribution files.**
4. **Enable the optional Backup software (Autochanger Software Module or Silo Support Module).**
5. **Fax or mail a copy of your registration window to Customer Service to register the optional Backup software and receive the permanent authorization code.**

After you install the device driver software, follow these steps to verify that the drivers are properly installed:

1. **Enter the following command:**

```
# /etc/LGTOuscsi/lusdebug 1
```

You should see the following response:

```
debug level was 0; is now 1
```

2. **Enter the following command:**

```
# /etc/LGTOuscsi/lusdebug 0
```

You should see the following response:

```
debug level was 1; is now 0
```

3. **Enter the following command:**

```
# /etc/LGTOuscsi/inquire
```

A list of SCSI devices attached to your server, if any, appears on your screen. If you attached your autochanger or silo before you installed the device driver software, the devices should appear in the list.

For example:

```
scsidev@0.0.0:FUJITSU M2263S-512 01 | Direct Access
scsidev@0.4.0:Quantum DLT4700 | Sequential Access
scsidev@0.4.1:Quantum TZ Media Changer | Changer Device
```

▼ How to Configure Autochanger Support

To use an autochanger for Backup storage management, you must first use the `jb_config` program to configure the auto changer and test the device driver software you installed. Follow the instructions in this section to configure and test the device driver software on a Backup server or storage node with an attached autochanger. For more detailed information, refer to the autochanger chapter in the *Solstice Backup 5.5 Administrator's Guide*.

To configure the autochanger:

1. **Become root on the Backup server.**
2. **Enter the** `jb_config` **command.**

3. **The program displays a list of jukeboxes. When prompted, indicate which jukebox to install.**

4. **Continue to provide the appropriate responses when prompted. For step-by-step examples of how to configure a SCSI or SJI autochanger, refer to the** *Solstice Backup 5.5 Administrator's Guide***.**

5. **Once configuration is completed, the program displays the message:**

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

When you use the `jb_config` program to configure an autochanger, a new resource is created with the name you specified. You can view the new resource in the Jukeboxes resource in the Backup administration program. Refer to the online help or the `nsr_jukebox(5)` man page for details on the attributes of the Jukeboxes resource.

To test the autochanger connection:

1. **Become root on the Backup 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; specify the control port and the device type.**

The control port for SCSI autochanger models is typically expressed in the format */dev/scsidev@n.n.n*. You can obtain the exact control port pathname from the response displayed by the jb_config command script:

```
These are the SCSI Jukeboxes currently attached to your system
1) scsidev@1.2.0: DLI Libra Series
2) scsidev@0.2.1: Quantum DLT/Digital DLT
```

For example, the following command runs the `jbexercise` program on the Quantum DLT/Digital DLT autochanger detected by the `jb_config` script:

```
# jbexercise -c /dev/scsidev@0.2.1 -m "Quantum DLT/Digital DLT"
```

See the appendix "Command Line Reference" in the *Solstice Backup 5.5 Administrator's Guide* or refer to the `jbexercise(1m)` man page for additional information on the command options available for the `jbexercise` command.

Caution – After you install, configure, and test the autochanger, enter the enabler code for the Backup Autochanger Module. Be sure to register and authorize the Autochanger Module; otherwise, the software will disable itself 45 days after you enter the enabler. See the following section for instructions.

▼ How to Enable and Register the Software

The Enabler Certificate you purchased provides the enabler code you need to enter to use the software permanently.

To enter the enabler code, follow these steps:

1. **Become root on your Backup server.**
2. **Start the GUI version of the Backup administration program with:**

```
# nwadmin &
```

3. **Open the Server window. Fill in the name, address, phone, and email information requested.**
4. **Open the Registration window.**
5. **Click the Create button.**
6. **Enter the enabler code in the Enabler Code field.**
7. **Select the Tabular option from the View menu, then select Print from the File menu. Fax or mail the output to Sun Customer Service. Optionally, you can email the form as an attachment to license@sun.com.**

After you enable the software, you have 45 days to register the software. Sun returns a unique authorization code to you after receipt of your completed registration form. To permanently enable the software, enter the authorization code in the Registration window.

To enable the Backup software, the specific process you must follow depends on whether the software you installed is for a new, updated, or evaluation version of the software.

- If you installed the Backup server software on your computer the first time for *evaluation* purposes, you have 30 days to use the software before you must purchase and enter an enabler code. You *do not* need to enter any evaluation enabler codes to evaluate any of the optional Backup software products within

the 30-day period. To use the Backup software and options beyond the 30-day trial evaluation, you must purchase an enabler code for the software you want to use.

- If you just purchased your *first* Backup product, an Enabler Certificate was sent separate from the product package. You need the enabler code on the certificate to enable and register the Backup product you purchased.
- If you purchased an *update* to your existing Backup software, use the enabler code provided in the letter you received that announced the updated software.

  Generate a new copy of the information shown in the Registration window and fax or mail the form to Sun Customer Service. A new authorization code will be returned for you to enter in the Registration window, which permanently enables your updated Backup software.
- If you have already entered your Backup enabler code on the server and want to *evaluate* any of the optional modules included with this software distribution, enter an evaluation enabler code for the product you want to evaluate. A list of enabler codes is provided in the letter you received with your software package. After you enter the evaluation enabler, you can evaluate the product with your existing Backup server software for 45 days. The evaluation enabler codes cannot be entered on more than one machine on the network. If you enter the code on more than one machine on the same network, a copy violation error occurs and the Backup server software is disabled. If you move the Backup software from one system to another, or change the network address of a system after the software is installed, you receive a message warning that the software will expire in 15 days. If you need to move your software or reconfigure your network, first contact Sun Customer Service to obtain a *Host Transfer Affidavit* to avoid an interruption in your scheduled backups.

Quick Test

The Backup software includes both a GUI and a command line interface. Use the GUI for this Quick Test. To learn more about the command line interface, refer to the `nsradmin(8)` man page.

To start the GUI version of the Backup administration program, enter the `nwadmin` command at the shell prompt:

```
# nwadmin -s server-name &
```

If Backup does not start successfully:

- The required Backup daemons, `nsrd` and `nsrexecd`, might not be present. To determine whether the Backup daemons are currently present, run the `ps` command at the shell prompt. If the output does not list `nsrd` and `nsrexecd` as current processes, enter `nsrexecd` and `nsrd` at the shell prompt to start the daemons.
- The DISPLAY environment variable might not be set correctly.
- The PATH environment variable might not contain the correct path to the Backup programs. Determine where the Backup programs reside and correct the value assigned to the PATH variable.

The speedbar buttons displayed in the main window of the GUI provide quick access to the most frequently performed Backup administration tasks.

The program's online help is available through the Help menu. You can view a topic that is specific to the window or scroll to another topic of your choice.

When you installed the `SUNWsbus1` package on the Backup server, the program automatically added the hostname of the server to the list of Backup clients and specified the special option `All` for the files to back up to the server. You can use the default setup provided by the installation to test the software and device connections, or modify the options before you perform the test.

▼ To perform a quick test of the Backup software:

1. **Insert a volume into the device you configured for Backup backups.**

   Instructions for using a stand-alone device are provided here. To use a device in an autochanger or silo, refer to the configuration instructions provided in the *Solstice Backup 5.5 Administrator's Guide*.

2. **Select the Label speedbar button to label the volume. The window displays the preconfigured label templates provided for you to use.**

3. **Click OK to label the volume with the Default label template.**

4. **Click the Mount speedbar button to mount the volume in the drive. Highlight the volume you labeled in step 3 and click OK to mount the volume.**

5. **Select the Groups from the Customize menu. The Default group is already configured and highlighted.**

   All you need to do to test the group backup is to select the Enabled radio button and then return to the main window.

6. **Click the Group Control speedbar button in the main window. The Group Control window appears with the Default group already highlighted. To start the test backup, simply click the Start button.**

7. **Click the Details button in the Group Control window to view the progress of your test backup. At the same time, messages appear in the panels of the main window as the backup progresses.**

8. **After the backup is completed, click the Indexes button in the main window to view the client file index entries made for the server during the test backup.**

   If the test backup did not run to completion successfully, refer to the troubleshooting information in the *Solstice Backup 5.5 Administrator's Guide* to determine the cause.

Removing the Backup Software

Use the `pkgrm` command to remove individual Backup packages or all of the Backup packages at the same time.

Caution – The individual Backup software packages depend on each other. You must remove them in the following order: `SUNWsbus1`, `SUNWsbun`, `SUNWsbus2`, `SUNWsbuc`. The man pages (`SUNWsbum`) and document files have no dependencies– you can remove them at any time.

▼ How to Remove the Software Packages

Removal of the Backup software packages requires three basic steps:

1. **Become root on the system from which you want to remove the software.**

2. **Enter the `nsr_shutdown` command at the shell prompt to shut down the Backup daemons. A list of Backup daemons that will be shut down is displayed, along with a prompt that asks whether you want to continue with the `nsr_shutdown` command:**

```
mars# nsr_shutdown
nsr_shutdown will kill the following processes
 25768 ?        S  0:02 /usr/sbin/nsrexecd
 25770 ?        S  0:01 /usr/sbin/nsrexecd
 25771 ?        S  0:02 /usr/sbin/nsrd
 25783 ?        S  0:00 /usr/sbin/nsrmmdbd
 25784 ?        S  0:00 /usr/sbin/nsrindexd
 25785 ?        S  0:00 /usr/sbin/nsrmmd -n 1
Do you want to continue? [Yes]? y
```

3. **After the** `nsr_shutdown` **command is carried out, issue the** `pkgrm` **command, with a list of the individual packages you want to remove:**

```
# pkgrm SUNW-packagename
```

If you do not specify any packages on the command line, the `pkgrm` script displays a list of all the installed software packages on the system, for example:

```
The following packages are available:
1 SUNWsbuc Backup for Solaris (Backup/Recover) Client (sparc) 5.5.Build.13
2 SUNWsbus2 Backup for Solaris (Backup/Recover) Device Drivers (sparc)
5.5.Build.13
3 SUNWsbum Backup for Solaris (Backup/Recover) Man (sparc) 5.5.Build.13
4 SUNWsbun Backup for Solaris (Backup/Recover) Storage Node (sparc) 5.5.Build.13
5 SUNWsbus1 Backup for Solaris (Backup/Recover) Server (sparc) 5.5.Build.13
... 167 more menu choices to follow;
<RETURN> for more choices, <CTRL-D> to stop display:
Select package(s) you wish to process (or 'all' to process all packages).
(default: all) [?,??,q]:
```

Specify the package number that corresponds to the package name displayed by the script to remove one or more packages. If you want to remove multiple packages, enter each number in descending numeric order, separated by a space before you press Return. After you press Return, a confirmation prompt appears for each package prior to its removal, for example:

```
SUNWsbuc Backup for Solaris (Backup/Recover) Client (sparc) 5.5.Build.13
Do you want to remove this package? y
## Removing installed package instance <SUNWsbuc>
This package contains scripts which will be executed with super-user permission
during the process of removing this package.
Do you want to continue with the removal of this package [y,n,?,q] y
## Verifying package dependencies.
```

If you enter the package numbers out of sequence and a package depends on a subsequent package in the list, a warning displays:

```
WARNING:
The <SUNWsbun> package depends on the package currently being removed.
Dependency checking failed.
Do you want to continue with the removal of this package [y,n,?,q]
```

If you answer `n`, the removal of the package is cancelled and the `pkgrm` utility moves on to the next package in your list. If you answer `y`, the removal continues. If you answer `q`, the `pkgrm` utility exits without removing anything from the dependent package on through the rest of the list you entered.

After each software package that you specified is successfully removed, the script displays the following message:

```
Removal of <SUNW-packagename> was successful.
```

Caution – Do not choose the default option `all` to remove the Backup software packages. Choosing this option might remove all the software packages that were installed on your computer using the `pkgadd` utility.

- To remove only the server software, enter the `pkgrm SUNWsbus1` command. This removes the `SUNWsbus1` package from the system where the server software is installed.
- To remove only the client software, enter the `pkgrm SUNWsbuc` command. This removes the `SUNWsbuc` package from the system where the client software is installed.
- To remove only the storage node software, enter the `pkgrm SUNWsbun` command. This removes the `SUNWsbun` package from the system where the storage node software is installed.
- To remove only the device driver software, enter the `pkgrm SUNWsbus2` command. This removes the `SUNWsbus2` package from the server or storage node where the device driver software is installed.
- To remove only the Backup man pages, enter the `pkgrm SUNWsbum` command to remove the `SUNWsbum` package from the server, storage node, or client where the man pages are installed.

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