



# TSM Edition User Guide

Version 8.2



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## \*Encryption Software

**System Backup Administrator Backup Data Encryption Feature** has a cryptographic component, using **Advanced Encryption Standard (AES)** "Rijndael" encryption algorithm in Cipher Block Feedback (stream) mode (CFB-128), supporting 128, 192 and 256-bit keys.

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# 1. Getting Started

## Supported Operating Systems & Hardware

As of the time of this publication, the *TSM Edition* software is supported on all AIX, Solaris, and Linux systems on which the **TSM Backup/API Client** software is supported. This includes, but is not necessarily limited to, the following systems:

**AIX:** All IBM *RS/6000*, *System p*, *System i*, *OpenPower* and *JS/20* systems running AIX Version 5.1 and later (currently 7.1).

**Solaris:** **x86 and x86\_64:** All Solaris 9 versions 9/05 and later (32 and 64-bit platforms), Solaris 10 versions 1/06 and later (32 and 64-bit platforms), Solaris 11 Express (64-bit platform), and Solaris 11 version 11/11 and later (64-bit platform).

**SPARC:** All Solaris 9 versions 9/05 and later, Solaris 10 versions 11/06 and later, Solaris 11 Express, and Solaris 11 version 11/11 and later. Includes *sun4u* and *sun4v* platforms.

**Linux:** **x86 and x86\_64:** All distributions which run on *Intel 32-bit* based processors and 64-bit processors capable of running 32-bit software (includes *AMD*, *Opteron* and *Athlon*-based systems). Linux kernel levels 2.4 and glibc 2.2.5 and higher are required. Support is provided for Linux LVM Library version 1.0 and higher, and Software Raid Devices (meta-disks) when installed. UEFI is supported on x86\_64 systems running 2.6.21 or later kernel levels, CONFIG\_EFI enabled in the kernel, and support for creating VFAT filesystems.

**PPC (IBM system P):** All distributions supported 64-bit systems with *PowerPC CHRP* hardware. Linux kernel levels 2.6.16 and higher, and glibc 2.4.2 and higher are required. Support is provided for Linux LVM Library version 1.0 and higher, and Software Raid Devices (meta-disks) when installed.

## Software and License Requirements

Installation of the TSM Edition software provides the graphical user interface, web interface and application programs for administering the backups of the *admin system* itself. Administration of client (node) system backups may also be performed from the *admin system*. It is also necessary to install a subset of the software onto each system that will act as either a backup media server or client.

The following table describes license types related to *TSM Edition*:

<b>TSM Edition</b>	<p>This license is installed onto a system from which <i>TSM (Tivoli Storage Manager)</i> backups will be managed. This system must be an AIX, Solaris or Linux system and does not need to be a TSM Server. The TSM Edition license supports <b>Full System Backups</b> and backups are performed to any TSM server or to a local tape device on each client. Any number of TSM servers may be configured, but you must have a Client License for each additional client (node) to be backed up.</p> <p>This integrates the Full System Backup and Adaptable System Recovery functionality of SBAdmin with the data file storage capabilities of TSM. A single license key is required for the TSM <i>Admin system</i>, which also defines the number of TSM clients (nodes) which may be managed by the administrator. Although no license key is required for each of the clients, the client software must be installed and configured on each TSM node before they may be managed by the TSM Admin system.</p>
--------------------	---



<b>TSM Client</b>	<p>Must be installed on each system which will be a client or backup media server. A <i>Client</i> license for the local (administrator) system is included with the <i>TSM Edition</i> license.</p> <p>This client must be managed by a <i>TSM Admin system</i>. No license key is required on the client since the number of supported clients and backup servers are defined by the <i>TSM Edition</i> license. Backup management features, such as scheduling and history reporting are provided only by the <i>TSM Edition</i>.</p>
<b>Backup Data Encryption Feature</b>	<p>This optional license may be added to a <i>TSM Edition</i> license to enable AES data encryption support for all backups. A license is purchased for the number of <i>Clients</i> for which backup data should be encrypted.</p>

Other administrator license editions for *Network*, and *Workstation* are also available, which provide backups to local and remote (*Network Edition*) disk and tape devices. Those editions also support multiple backup types, from files and directories to volume groups and raw logical volumes. Since this *TSM Edition* supports only **Full System Backups** and **TSM Servers** as backup media, all other administrator licenses are documented in a separate user guide. Refer to the **System Backup Administrator User Guide** for details.

## Evaluation License Key

All license options and features above, except the **TSM Client** require a license key. The license keys are installed only onto the *TSM Admin system*, and must be obtained from Storix. For all licensed options, the user may type the word "trial" for a free 30-day evaluation of all features of the software.

# Software Installation and Configuration

The following instructions may be used to install the software from either installation images downloaded from the Storix Software web site (<http://www.storix.com>) or from a SBAdmin installation CDROM:

## Downloading and Installing from the Web Site

1. Select the software package you wish to download from the web site based on your **operating system type, machine type** and desired **software configuration**.



Be sure to download the file in BINARY. Some browsers will recognize the ".tar" extension of the file and ask you if it should open the file or expand it. You should NOT do so, but select to save it to disk instead.

2. Change to the /tmp directory:

```
cd /tmp
```

3. Extract the contents of the file. Note that this does not extract the software, but only the installation program files and install image:

```
tar -xvf IMAGEFILE.tar (where IMAGEFILE.tar is the name of the downloaded file)
```

4. Run the installation program by typing:

```
./stinstall
```

## Installing from CDROM

1. Mount the cdrom by typing:

- a. On **AIX** systems: `mount -v cdrfs -r /dev/cd0 /mnt`
- b. On **Linux** systems: `mount -t iso9660 -r /dev/cdrom /mnt`
- c. On **Solaris** systems: Normally, a CDROM will automatically be mounted to the `/cdrom/cdrom` directory when inserted. If this is the case, replace `/mnt` with `/cdrom/cdrom` in the following commands. If the cdrom is not auto-mounted, type :  
`mount -F hsfs -o ro /dev/dsk/c1t0d0s0 /mnt`  
(where c1t1d0s0 is an example of your cdrom drive name).

2. Run the installation program by typing the following, then follow the instructions provided:

```
/mnt/stinstall
```

3. When complete, unmount the CDROM by typing:

```
umount /mnt
```

## Updating the Software

To update the software connected to the internet, you can automatically check, download and apply updates directly from the Storix Web Server by selecting [Help→Download Software Updates](#) from the user interface. A screen similar to the following will appear:

The screenshot shows a dialog box titled "Current Administrator SBAdmin Level: 8.1.0.0". It contains three sections: 1. A question "Do you wish to also check/update configured clients?" with "Yes" and "No" radio buttons. 2. A section for "Use HTTP proxy?" with "Yes" and "No" radio buttons, and input fields for "HTTP Proxy:" and "Port:". 3. Two buttons at the bottom: "Check for Updates Only" and "Download and Install Updates". A red "X" icon is also present next to the second button.

You will have an option of checking for updates only and/or downloading and installing updates. You will have an additional option of automatically applying updates to configured clients.

If the system cannot contact the Storix Web Server directly, you may apply updates by re-installing the software using the same instructions used to initially install the software (shown above). When you re-install the software onto the *Admin* system using the "**stinstall**" command described above, you will be asked if you wish to install the new software level onto configured clients.



Re-installing the software will replace existing program files, but **WILL NOT OVERWRITE** current configuration or history files.

# Starting the Software

There are three user-interfaces available for performing SBAdmin operations:

1. **Graphical-User (Xwindows) interface (GUI)** - This is the interface described in this user guide.

To access the graphical user interface, also referred as the “*backup administrator*”, type:

```
sbadmin
```

from within an *xterm* window. If you wish to run the application on a display attached to a different host (perhaps even a PC running an Xwindows emulator), type:

```
sbadmin -display hostname:0 &
```

(where *hostname* is the host name of the remote system). It may also be necessary to provide access to the application to write to the display by first typing “*xhost +*” within an *xterm* window on the remote system.

When starting the administrator software, the [Main Screen](#) will appear.

2. **Web-based interface** – This interface is accessed through a web browser and is designed to be similar in use and function to the GUI interface. You must have enabled the web interface when installing the software on the Administrator System. Refer to the [SBAdmin Web Interface Install Guide](#) for additional details on installing, configuring and starting this interface.
3. **Command-line Interface (CLI)** – This refers to running commands provided with this software at the shell prompt. Commands may only be run when logged on as the root user, or another user already configured using the GUI or Web interface. Various commands may be run on the administrator or client system. Refer to the [SBAdmin Commands Reference](#) for details.

## Enabling Optional Features

The optional feature, [Backup Data Encryption](#), may be enabled after the *TSM Edition* has been installed. To enable this feature, select [File→Preferences→Software License](#) from the menu bar on the [Main Screen](#). Refer to [Software License](#) in the [Preferences](#) section for details on viewing and changing the license options.

## Initial TSM Setup

### TSM Server

The TSM Server software must be at level 5.2 or later. Refer to the TSM documentation for instructions on checking and updating the TSM server.

### SBAdmin Management Class

Before any backup may be performed to TSM, you must define a new management class on the TSM server called SBADMIN. All SBAdmin backups will be stored under this management class. The management class must be defined to disallow versioning of backup objects. The management class must be created using the *TSM Integrated Solutions Console* or using the following command within **dsmadm**:

```
DEFINE MGMTCLASS domain_name policy_set SBADMIN
```

Next, you must turn off file versioning in the **BACKUP copygroup** of the management class. This is done by setting the number of versions of each file to be kept to “1” and days to retain inactive versions to “0”:

```
DEFINE COPYGROUP domain_name policy_set SBADMIN TYPE=BACKUP \  
    DESTINATION=backup_pool VEREXISTS=1 RETonly=0
```

Once the **copygroup** and management class are defined we need to activate the **policyset** with the command:

```
ACTIVATE POLICYSET domain_name policy_set
```

## TSM API Client

The *TSM API Client* software is normally installed on each node when the *TSM Backup/Archive Client* software is installed. This is required by SBAdmin. To check if the API client is installed:

**On AIX:** Ensure the *tivoli.tsm.client.api.32bit* fileset is installed at level 5.2 or later:

```
lsllpp -l tivoli.tsm.client.api.32bit
```

**On Linux:** Ensure the *TIVsm-API* package is installed at level 5.2 or later:

```
rpm -qa | grep TIV
```

**On Solaris:** Ensure the *TIVsmCapi* package is installed at level 5.2 or later:

```
pkginfo -l TIVsmCapi
```

## 2. Introduction

**System Backup Administrator (SBAdmin)** is designed to simplify the administration of backups on the local system as well as client backups in a networked environment. *TSM Edition* provides the ability to perform a **Full System Backup** of an AIX, Linux or Solaris *TSM client* to any *TSM server*. It does so by combining powerful backup tools with an easy-to-use graphical and web-based interface for administering backups of an unlimited number of client systems (nodes) from a central system (*TSM Admin system*). **Full System Backups** created by the *System Backup Administrator* may be used to reinstall the source system or another system with an entirely different disk configuration. Backups may be automated through the use of a backup scheduler and queuing system, and client systems may be booted from another client (configured as a *network boot server*) and installed from backups read directly from the TSM server.

In order to accommodate backups of the TSM server itself to alternate media, you may backup one TSM server to another TSM server or you may perform backups to **local tape** on each client (a configured SBTAPE device). This applies to both the TSM server and any TSM clients (in case the TSM server is unavailable).

This document will provide a description of all of the functions of the *SBAdmin – TSM Edition*, and will include instructions for performing common tasks. For additional detailed information on each option within the application, you may get on-screen help by simply clicking the right mouse button over the object in question.

This document is intended only to provide instructions on the use of the SBAdmin graphical user interface. Most tasks may be performed using the Web-based Interface, which is documented in the ***Storix System Backup Administrator Web Interface Install Guide***.



The remainder of this document provides instructions on the use of the *System Backup Administrator (SBAdmin)* graphical user interface.

Most instructions shown here may also be performed using the web-based interface and any compatible web browser. The concepts are the same, but exact instructions differ from when using the GUI interface. When using the web-based interface, refer to the ***SBAdmin Web Interface Install Guide***.

The ***SBAdmin Commands Reference Guide*** is also available for information on running commands at the command line, some of which may be used to perform backups, verifies and restores from clients without using the administrator interface. It also describes a number of commands which may be used to perform backup administrator-related functions.

## SBAdmin Terminology

It is important to understand the relationship between the different systems that will interact with the Backup Administrator software:

- **Admin System** - This is the system running the *TSM Edition* software. All clients (nodes) and backup options are configured and managed from the admin system, and the admin system will centrally perform all tasks for the clients, including scheduling and running the backup jobs, monitoring backups, performing verifies and restores, and even recreating volume groups and filesystems.
- **Server** - This is the *TSM Server* on which the backup media is attached and backups are stored. SBAdmin does not manage the TSM server, so the TSM server may be any type of system. Although there are some considerations on the TSM server, noted in the TSM Server section, the TSM server simply acts as a backup device for all SBAdmin backups, and is not managed by the *Admin System*. Select this link for more information on [configuring the servers](#) used by this application.
- **Client** - This is the TSM client (node) system from which backups will be made. The admin system must also be configured as a client (node). Select this link for detailed information on [adding or](#)

[removing a client.](#)

The clients and servers, as well as the client node information may be displayed on the [main screen](#) of the application. The application will constantly monitor the status of the clients and servers, and the icons on the screen will represent whether or not the system or device is available.

Additional terms are commonly used in this document and in the application:

- **Backup Profiles** - Any number of backup profiles may be created, which will contain the backup defaults to be used when performing a backup job. This prevents the need to answer the same questions repeatedly when configuring backup jobs. Select this link for detailed information on adding or removing a [backup profile](#).
- **Backup Jobs** - A backup job will contain all the information needed to perform a backup, including the client(s) to backup and the server to backup to. A [backup profile](#) will be assigned to the job, which will provide most of the common backup defaults. The information in the profile, however, may be customized for each job. A backup job is identified by a **Job ID** and may be scheduled to run only upon demand, only once at a specific date and time, or scheduled to run on a regular basis. A backup job may contain one or more clients. If multiple clients are included in a single job, the data for all clients is referenced by the same *backup ID*. Select this link for additional information on creating, scheduling and running [backup jobs](#).
- **Job Queues** - The SBAdmin application provides a queuing system that manages multiple backup jobs, and can prevent too many backups from writing to the same server at the same time. A queue is defined for each server for which a backup job is scheduled. Backup jobs are added to the queues when they are [run](#). The queues may be displayed in the main screen of the application, providing an easy glance at the queue contents and the status of queued jobs, and action buttons for manipulating the queued jobs. The jobs may be started, stopped, removed from the queue or placed on hold. Running jobs may be monitored, displaying the backup progress and/or the backup output messages. Select this link for more detailed information on [backup queues](#) and how to manipulate backup jobs in the queue.

## The SBAdmin System Backup

This backup contains the operating system and optionally all user data. User data may be only files in mounted filesystems, or may also contain raw data found in logical volumes (**AIX/Linux**), partitions (**Linux**) or meta-disks (**Linux/Solaris**), disk slices or ZFS volumes (**Solaris**). It is possible to reinstall the entire system from a System Backup, or even use the backup of one client to install another. Select files, directories, logical volumes and volumes groups, and even raw data may be restored from a System Backup. For information the system installation process, refer to the ***SBAdmin System Recovery Guide***.

**AIX:** The system backup contains the *rootvg* volume group, and may optionally contain some or all of the other volume groups on the system. If the backup is performed to **tape**, then this tape is also configured to boot to the **System Installation process**.

## SBAdmin and TSM Integration

While *SBAdmin Network and Workstation Editions* provide various levels of backups to local and remote media (tape and disk), the *SBAdmin TSM Edition* focuses on what TSM customers need most - a full-system backup which can be used for complete system recovery, cloning and hardware migration. This backup can be written directly to, and restored directly from, a *TSM server*. And SBAdmin manages the TSM backups, including the backup retention and deletion. In addition, client backups can be written to **local tape** on each client. This provides the ability to keep a separate (non-TSM) system backup of any client, including the TSM server system.

SBAAdmin utilizes the **TSM Client API** (application program interface), also referred to as an **application client** within some TSM documentation. Backups performed within TSM use the **TSM Backup/Archive client**. These backups differ from those performed with SBAAdmin using the API client. Backups performed by TSM are not visible within SBAAdmin, and SBAAdmin backups to the TSM server are not viewable within TSM. However, the same policies which apply to other TSM *management classes* and *storage pools* may also apply to SBAAdmin backups.

## TSM Backup Retention

SBAAdmin writes backups to the “**SBADMIN” Management Class**, which must be defined on the *TSM server*. Having a separate management class for SBAAdmin backups ensures that certain required policies are enforced, and allows you to assign a separate storage pool to SBAAdmin backups than those used for other TSM backups.

While other TSM backups place each separate file in a backup image, and provide version control for each individual file, SBAAdmin backups use a single image for each filesystem or raw device (i.e. logical volume or partition) that is backed up. SBAAdmin backups, therefore, contain much less catalog space on the TSM server, and add little management workload to the server.

SBAAdmin backups do not allow versioning control by the TSM server. This is because each SBAAdmin backup has a unique object name. SBAAdmin backup retention policies will provide the ability to control the number of backups retained on the server, as well as the age of the backups. Backups are automatically deleted from the server only when replaced by more recent backups.

## Shared Versus Owner Access

SBAAdmin backups to a TSM server may be designated as either *shared access* or *owner access* when the backup is created. Backups created with shared access may be restored by any other client (node). This provides the ability to create master backups which may be used for cloning, provisioning, or migration of operating systems, volume groups, filesystems, etc, to different hardware. If a backup is created with owner access, only the original node will be able to read from that backup.

## TSM Server Authentication

The **TSM Admin System** configured for SBAAdmin must be a TSM node itself (may also be the server). On the admin system, you will define the **TSM clients** (nodes) and the **TSM servers**. SBAAdmin does not use the *TSM client options file* (dsm.opt) nor the *TSM client system options file* (dsm.sys) defined for other applications. Instead, all clients and servers are defined on a single system (the admin system) and are copied to the clients as needed.

When a server is defined on the *admin system*, a **TSM Administrative User** name and password must be defined also. This TSM Administrative user must have been previously configured within TSM to have *System*, *Storage* or *Policy* authority. This administrative user will be used to manage the backups performed by SBAAdmin. The administrative username and password is stored in a protected and encrypted file on the admin system and is never sent over the network or saved on any of the clients.

Client passwords must be defined on the admin system if the node uses **PASSWORDAccess “prompt”** to access the server. In this case, the node password will be copied from the admin system to a protected file on the client and passed to the server whenever the client accesses the server. If the node uses **PASSWORDAccess “generate”**, the node password need not be defined on the admin system (assuming the node has previously accessed the server and therefore has already created a TSM encrypted password file. This is the preferred method of server authentication since it does not require the admin system to store a copy of each node’s password.

## Additional Notes

1. TSM exclude list processing does not affect SBAdmin backups. You must define your exclude lists (files, directories, filesystems or devices to exclude) within SBAdmin.
2. The compression option in the TSM server options will be ignored if you have set a SBAdmin backup job to use compression. To use TSM compression, turn off SBAdmin compression and turn on the compression option in the server options.
3. LAN-free backups are not supported.
4. Communication method of “shared” (shared memory) is not supported. This option would only allow a backup of the TSM server to itself, which would be useless for full system recovery of the TSM server.
5. The Tivoli environment variables used by TSM and other API client applications are not used by SBAdmin. These include *DSMI\_CONFIG*, *DSMI\_DIR* and *DSMI\_LOG*. Configuration files are generated on the admin system and transferred to each client automatically. SBAdmin uses its own TSM configuration files in the */storix/config/tsm* directory (where */storix* is the data directory defined when you initially installed the software). This prevents any conflicts with other software using the TSM API client.



# 3. The SBAdmin User Interface

The [SBAdmin User Interface](#) is used for all configuration options, including servers, clients, jobs, profiles, etc. It is also used for the monitoring of job queues, displaying job status, backup output messages, and backup history.

After all backup jobs are configured and scheduled; they will continue to run even if the SBAdmin interface is *not* running. Backup jobs may also be manually started, monitored or controlled from the command line when the interface is not running, and can be monitored or controlled after the administrator is restarted.

Ordinarily, messages regarding the status of the backup jobs are reported on the screen. If, however, the SBAdmin interface is not running when a job is run, the status messages will be reported using an [alternate notification](#) method, which may be defined by the user.

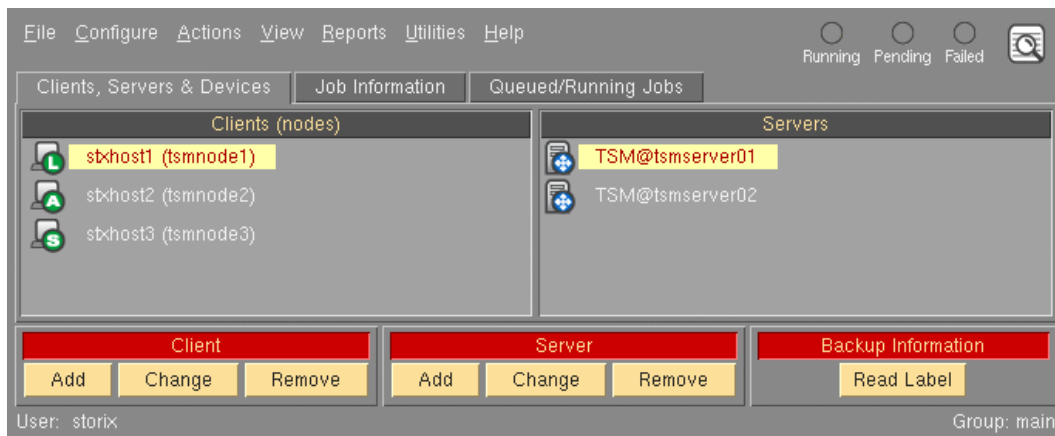
## The Main Screen

The following is a sample of the [Main Screen](#), which appears when the application is first started. The options at the top-left of the screen (File, Configure, etc) are contained in the [menu bar](#). Click on any of the menu bar options to display a pull-down menu of options in each category. When selecting an option from the menu bar, a new screen, or [window](#), will appear with additional optional options that apply to the menu selection.

At the top-right of the screen is the [status bar](#). This contains indicators that will show green, yellow or red, indicating if there is backup job in the queue that is either running, pending (waiting) or failed, respectively. It also contains a button to view the log of backup status messages not already displayed.

The remainder of the screen will vary depending on the "Display" tab chosen:

- **The Clients & Servers** display tab is shown below. In this example, several clients and servers have already been configured. The application continually checks the availability of the systems, and displays an icon that represents both the client system type (**A=AIX**, **L=Linux**, **S=Solaris**) and whether or not the system is available (**Green**=available, **Red**=not available). Since it may not be possible to determine the Server System type, a blue server icon (⚙️) is displayed if the server is available, which will display in red if the server cannot be contacted.



A client may be selected by clicking the left mouse button on the icon next to the client hostname. Likewise, a server may be selected by clicking the mouse button on the server icon. The *selected* client or server will appear with a highlighted background.

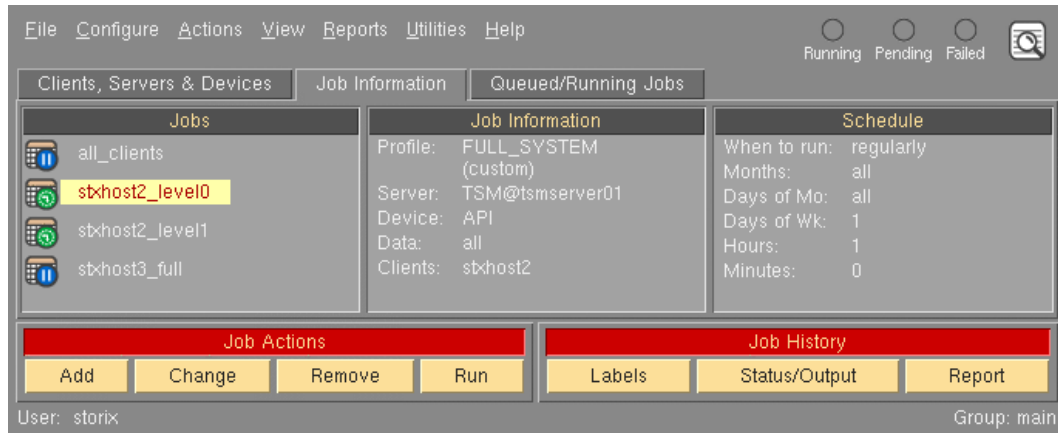
The action buttons at the bottom of the screen apply to the selected client and/or server. They provide a shortcut to performing the same tasks that can be performed from various options within the menu

bar. If you want to display the backup labels for all backups stored on the server, you must select a server and a client (original owner of backups to display), then press the **“Read Label”** button.

- **The Job Information** display tab provides a quick glance at the jobs that are configured. By clicking on a job icon, the job information and schedule information are displayed in the right two display areas and the job name is highlighted.

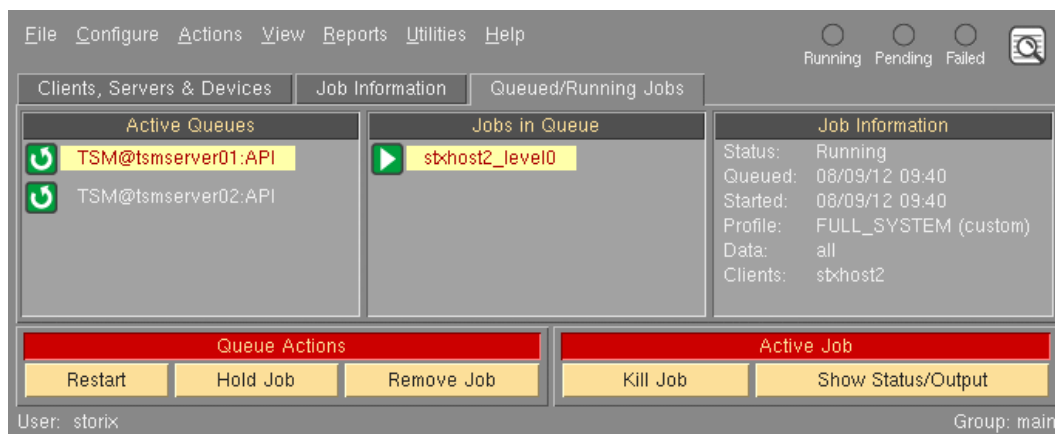


The represents a job that is not scheduled. The represents a job that is scheduled.



The action buttons at the bottom apply to the selected job. They are shortcuts for various job-related functions. The **Job Actions** buttons perform the same job operations available from the [Action](#) menu on the menu bar. The **Run** button will place the selected job in the queue (even if it is scheduled to run at another time), and it will be run as soon as the server and device assigned to the job are available. Each of these functions is described in detail in the section [Schedule or Run Backup Jobs](#). The **Job History** buttons may be used to [view backup labels](#), [status/output messages](#) or a [history report](#) for previously run jobs.

- **The Job Queue** display tab provides a look at the jobs that are currently in the queues. A queue is shown in the left-most display area, which consists of the backup server and the device name. When you click on a queue, the selected queue is highlighted, and the jobs in the selected queue are displayed in the middle display area.



You may then click on a particular job to display the job information, including the status of the job. Both the queue and job icons represent the status of the job. The **Queue Actions** buttons at the bottom of the screen may be used to manipulate the selected job. The **Active Job** buttons include the ability to **kill** a running job or display the status or output messages of a running or failed job. All of these

functions and a list of any possible icons or status messages are described in detail in the [Job Queues](#) section.

## Closing Windows

A common icon which appears at the bottom of each window is:



**Cancel button**

After making changes to information on any screen, use the cancel button to cancel the changes and close the window. Avoid using the window-manager button (usually at the top-left of the window) to close windows as this does not always perform the entire cleanup needed. The Cancel button does not appear on the [Main Screen](#). From the Main Screen, you should always use the [File→Exit](#) option on the menu bar to exit the application, and you may use the icons in the title bar for other window manager functions, such as iconifying the window.

## 4. Users

When you first installed SBAdmin, an “**admin**” user was created and you were prompted to provide a password for this user. The admin user is given authority to all (*System Admin*) functions within the SBAdmin application, including configuring other users.



If there is only one user configured, and you are logged onto the system as “root”, you are logged into the application under this user by default, and you will not need to provide a username or password at the command-line.

However, for the SBAdmin Web Interface, you must always provide a username and password.

You may configure one or more users, each with permission to perform different tasks. Each user will be assigned to a default group, but a user may be allowed access to different *groups* (see [Configuring Groups](#)).

### User Levels (Roles)

By configuring other users you will be able to limit their permissions and roles within the software. Configuring users at different level roles is useful if multiple people are accessing the administrator, and security policy dictates what access each person should be able to do. The following are the four types of users that may be configured within SBAdmin:

- **Backup User** - limited to monitoring backups and running backup jobs that are already configured by a privileged user.
- **Backup Admin** - allowed to configure backup settings and backup jobs. They are also able to monitor backups and run backup jobs.
- **Group Admin** - allowed all *Backup Admin* functions as well as configure application settings, clients and servers within their *group*.
- **System Admin** - allowed all access and may configure all backup functions as well as application settings, clients, servers and groups.

### Adding a User

To add a user, select [Configure→Users](#) from the menu bar. A screen such as the following example will appear:

From this screen, type the user name in the **User name:** entry field. When adding a new user you must also specify the **Default Group**, **User Password**, and **Select the access level for this user** section. Press the **Save** button to add the newly configured user.

When finished, press the **Cancel** button at the bottom.

- **User name** – This field indicates the username within the SBAAdmin program. This does not need to be a user defined on the Unix/Linux system.
- **Default Group** – This is the group that the user will be logged into when launching the SBAAdmin interface. To allow this user to access other groups Please refer to the [Groups](#) section of this guide.
- **User Password** – These fields are for specifying or changing the user password. User passwords are encrypted and do not need to correspond with passwords on the Unix/Linux system.
- **Select the access level for this user** – This selection will determine what functions the user may perform. For more information please see the [User Levels \(Roles\)](#) section of this guide.

## Removing a User

Click [Configure→Users](#) from the menu bar. Select the name of the user to remove from the list and press the **Remove** button. Any configurations this user may have made will remain intact; however the user may no longer log into the Administrator.



You must have at least one user with System Admin access to each group.

When finished, press the **Cancel** button at the bottom.

## Changing a User

Click [Configure→Users](#) from the menu bar. Select the name of the user to change from the list. Here you may enter a new password into the **User Password:** and **Re-enter Password** fields and or **Select the access level for this user**. To change the user press the **Save** button.



Users with access lower than Group Admin will only have the ability to change their password. All other fields will be disabled.

When finished, press the **Cancel** button at the bottom.

## Changing your User Information

Only a user with System Admin access can add, change or remove other users. Other users can change their own information by selecting [Configure→User Information](#) or [File→User Information](#) (for users with only Backup User access).

You will see the same screen shown above, but will only be able to change your Default Group and your Password. Simply select a new default group (if more than one available), or enter a new password in the fields provided and press the **Save** button.

# 5. Groups

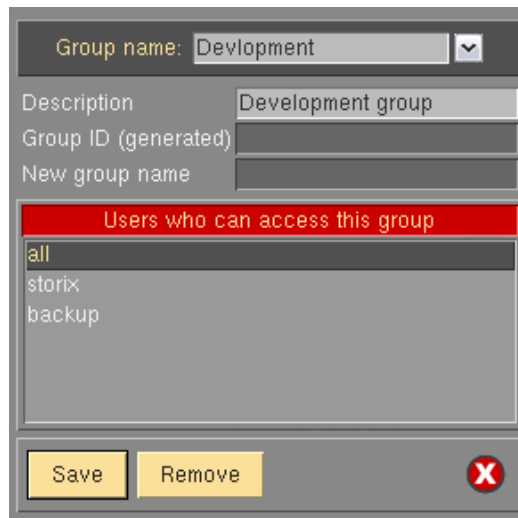
To configure Groups you must be logged into SBAAdmin as a [User](#) with “System Admin” privilege.

When SBAAdmin was first installed the group “main” was created. “main” will function as the default group and no further group configuration is necessary. You may choose to configure groups to assist with organization or security in your backup environment.

Groups are used to allow a single SBAAdmin to organize and manage Storix [Clients](#) and [Servers](#); and may be configured to allow or restrict certain [User](#) access. Groups are also necessary when configuring servers that will share or limit client access based on group ID. For further examples of groups please see the [Using Groups](#) section of this guide.

## Adding a Group

To add a group, select [Configure->Groups](#) from the menu bar. A similar looking screen will appear:



From this screen, simply type the name of the group to add in the **Group name:** entry field and optionally a **Description** of the group. The **Group ID** field will be automatically populated with a unique value to be associated with the group. The **New group name** field is only used when [changing a group](#). Select any users who should have access to this group from the **Users who can access this group** box. Then press the **Save** button.

When finished, press the **Cancel** button at the bottom.

- **Group name:** - This field defines the name of the group to be added.
- **Description** – This is an optional field, it is used to elaborate on and clarify what this group may be used for.
- **Group ID** – This field will be automatically populated when adding a group. It is a unique identifier and will not change if the group name is later changed.
- **New group name** – This field is only used when [changing a group](#).
- **Users who can access this group** – This field allows you to specify one or more users that have permission to launch the SBAAdmin interface under this group. For more information on users and user roles please see [Configuring Users](#).

## Changing a Group

Click [Configure→Groups](#). Select the name of the group you wish to change from the **Group name:** drop down arrow to the right. You may now edit the **Description** and **New group name** fields or select/deselect users from the **Users who can access this group** box. Once you have made the appropriate changes press the **Save** button to update the group.



The “Group ID” field will never change. Once a group has been configured this value will always be used to identify the group.

## Removing a Group

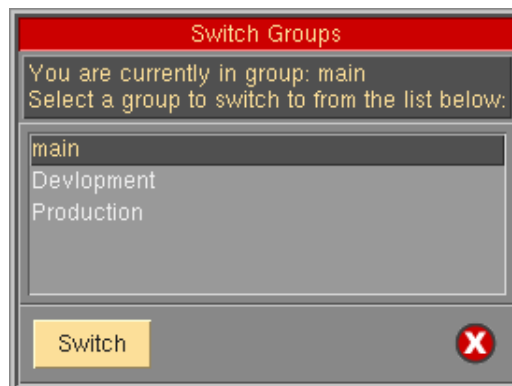
Click [Configure→Groups](#) from the menu bar. Select the name of the group to remove from the list and press the **Remove** button. When finished, press the **Cancel** button at the bottom.



A group may only be removed after all clients and servers have been removed from the group.

## Switching Groups

Select [File→Switch Group](#) from the menu bar and Select the name of the group you would like to switch to, then press the **Switch** button. This will cause the SBAdmin interface to close and re-open under the new group. The clients, servers, media, jobs and queues will all update to reflect the settings in the new group.



Only one instance of the sbadmin graphical interface may run per group. You may launch multiple instances of the interface with different groups using the **-G** command. The following command illustrates how to launch the interface for the group “main”.

```
# sbadmin -G main
```



## 6. Configuring Clients (Nodes)

A client is defined as any TSM node that will be backed up using SBAdmin.

Any number of clients may be added to the administrator as long as the total number of clients does not exceed the number of clients licensed to SBAdmin. Note that the administrator itself also includes a client license, so it may be configured as a client or server without using one of your additional client licenses.

### Adding a Client

Any client may be added to the administrator by simply adding its hostname. However, the number of clients which may be added is dependent on the number of clients the administrator is licensed for. Also, any client hostname may be added, but the client is only accessible to the administrator after the software has been installed and configured onto the client system as well.

The following information is needed before configuring a TSM client:

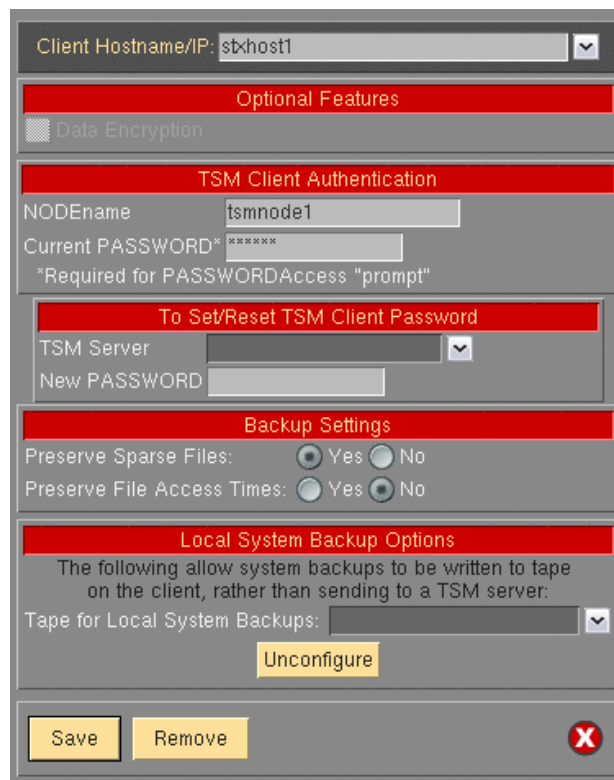
**Node Name** (required)

**Password** (required if using PASSWORDAccess "prompt" on the server)

To add a client, select one of the following from the menu bar:

- [Configure→Clients](#)
- Click the [Add Client](#) button at the bottom of the [Main Screen](#) when the [Clients & Servers](#) are displayed.

After selecting the appropriate option above, the following window will be displayed:



Client Hostname/IP: stxhost1

**Optional Features**

☐ Data Encryption

**TSM Client Authentication**

NODEname: tsmnode1

Current PASSWORD: \*\*\*\*\*

\*Required for PASSWORDAccess "prompt"

**To Set/Reset TSM Client Password**

TSM Server: [dropdown]

New PASSWORD: [text field]

**Backup Settings**

Preserve Sparse Files: ☒ Yes ☐ No

Preserve File Access Times: ☐ Yes ☒ No

**Local System Backup Options**

The following allow system backups to be written to tape on the client, rather than sending to a TSM server:

Tape for Local System Backups: [dropdown]

Unconfigure

Save Remove [X]

To add a new client, enter the hostname of the client in the entry field at the top. Note that the hostname you enter may be a simple hostname (i.e. *ariel*), a full domain name (*goofy.storix.com*) or IP Address and must be known to the [admin system](#). Then select any optional features that apply to this client. When you've made your selections, select **Save** to save.

To change an existing client, you may type the client name, or use the arrow button to the left of the field to select from a list of configured clients. You may then select or deselect optional features, change other entries, change the TSM password of the client on the server, or remove the client.

## TSM Node Name and Password

You must enter the nodename of the client in the **NODEname** field. This is the name of the client system as known to the TSM server. The password of the client will be required if the **PASSWORDAccess** option of the TSM server is set to "**prompt**", since the password must be provided with each command executed between the client and server. This password will be stored on the client in a protected file, and in non-textual form, for use by SBAdmin commands.

## Set or Reset the Node's Password

This screen can also be used to set or reset the password of the node on the server by selecting the **TSM Server** in the drop-down list, and entering a new password in the **New PASSWORD** field. In this case, you must also enter the **Current PASSWORD**, regardless of the **PASSWORDAccess** option of the server.

## Enabling Backup Data Encryption for a Client

The **Data Encryption** option will be enabled only if the **Backup Data Encryption Feature** is installed. If so, you may select this button to indicate that data may be encrypted when backing up this client. Any type of data, for any client type, may be encrypted using 128, 192, or 256-bit AES encryption. Encryption is configured for specific clients according to the number of clients your encryption license supports. You may only select this button for the number of clients your encryption license supports.



Enabling data encryption for a client does not cause all backups to be encrypted automatically. It only designates which clients will support encryption. For clients that support encryption, the encryption option becomes available when configuring [backup jobs](#).

To encrypt data for a client, each client must have at least one configured Encryption Key. The encryption key must be a 32, 48 or 64-byte hexadecimal number, depending on the number of bits of encryption used. An encryption key will be given a user-defined Encryption Key ID, and you may have as many Key IDs as you like. You will later select which Key ID to use when performing a particular backup.

To prevent encryption keys from ever being transmitted across the network, the encryption keys may not be configured from within the GUI interface, and client keys may not be configured from the *admin system*. Instead, you must run the **stkeys** command on each client for which encryption is to be used. Refer to **stkeys** in the [Commands Reference Guide](#), and the [Encrypt data](#) field in the backup job configuration for additional information.

## Tape for Local System Backups

A client may perform a System Backup to its own direct-attached tape drive, if available. This allows any client with a tape drive to backup to itself without the use of a server or any network traffic. This tape may then be used to reinstall this client. You can move the tape or tape drive to a server to make the backup available to any client, or you can move the tape or tape drive to any other client to allow then to perform a local system recovery.

Since the tape drive names may differ for each client, you will select in this field the name of the tape drive to configure. Only tape drives that are configured and available on the client will be shown. Although multiple tape drives may exist, you may only select one drive per client for system backups.

Note that this option will create a special tape device with the name “SBTAPE”. This device will then be available when you configure a backup job and indicate the backup is to a local tape device. Refer to [Creating a Local System Backup](#) in the job configuration for more details.

## Sparse File Handling

A [sparse file](#) is a file in which blocks of data have been written non-sequentially, leaving unallocated blocks in the middle of a file. If the sparseness of a file is not preserved when restoring, the file will be expanded to include all blocks in the middle of the file, often causing a filesystem to inadvertently run out of space.

Preserving sparseness in files is usually desirable. This is sometimes a problem, however, if your files were pre-allocated using **NULL** characters. If a file is created and all blocks are allocated by writing nulls, or "0"s, throughout the file, the file appears identical to a sparse file on the backup. Since files containing null blocks are indistinguishable from sparse files, the blocks are not retained upon restore. The affect is that a file created at a large size could be restored to a very small size.

To resolves this issue, you may select the **Preserve Sparse Files** option so that all backups of this client will be created without preserving the sparseness of files. Therefore, if a file was pre-allocated using NULL blocks, the null blocks will also be restored. Note that, when using this option, a truly sparse file (created without pre-allocating blocks by writing nulls) will be interpreted as a large file of null blocks, and will be expanded upon restore in order to retain the null blocks. This will often cause the filesystem to run out of space since a file that was once very small is restored quite large.



If a backup is created by preserving sparseness, which is the default, then the backup files may not be restored to another system of a different operating system type. If you want to restore a backup to a different operating system type, then you should turn OFF sparse file handling BEFORE creating the backup.

Press the **Save** button to add or change the client settings. After adding a client, its icon will immediately appear on the [Main Screen](#) when [Clients, Servers & Devices](#) are displayed. If the software has not been configured on the client, or if the client was not configured using the correct hostname of the admin system, the client icon will appear in red. If the software is installed and configured properly on the client, the icon will appear green to indicate that the client is accessible to the admin system.

## Removing a Client

A client may be removed from the system only if it is not assigned to any backup jobs. If it is, you will be informed so, and you must [remove or change the job](#) to remove the client from the list of clients to backup.

To remove a client, either:

- Select a client on the [Main Screen](#) when [Clients & Servers](#) are displayed, then click the **Remove Client** button at the bottom of the screen, or
- Click [Configure→Clients](#) from the menu bar. Select the name of the client to remove and press the **Remove** button.

The client icon will be removed from the [Main Screen](#) when [Clients & Servers](#) are displayed.

# 7. Configuring TSM Servers

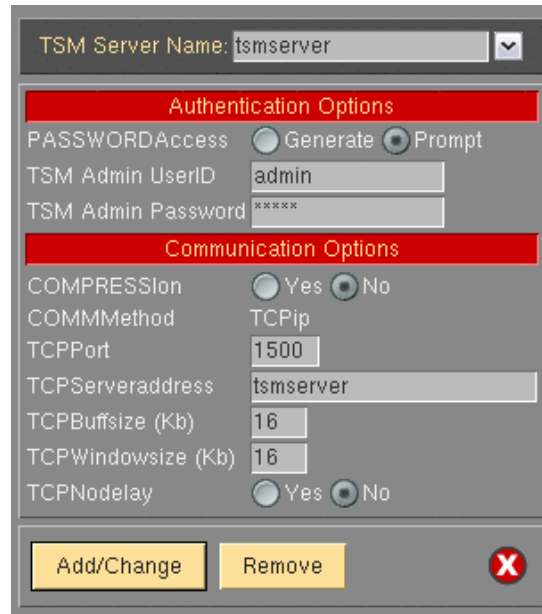
Any TSM server, and any number of TSM servers may be configured for use by SBAdmin TSM Edition. This is not limited by the number of client licenses installed. In addition, a single physical TSM server may be accessed using different TSM server configurations. For example, one server (*tsmserver-comp*) may be configured to backup data using TSM compression, while the same server (*tsmserver-nocomp*) may be configured to backup without using data compression.

## Adding a TSM Server

A new server may be added to the system by either:

1. Selecting [Configure→Servers](#) from the menu bar, or
2. Pressing the **Add Server** button at the bottom of the [Main Screen](#) when [Clients & Servers](#) are displayed.

After doing so, a screen similar to the following will be displayed:



The screenshot shows a configuration window for a TSM server. At the top, there is a text field labeled 'TSM Server Name:' with the value 'tsmserver' and a dropdown arrow. Below this is a red header bar labeled 'Authentication Options'. Under this header, there are three fields: 'PASSWORDAccess' with radio buttons for 'Generate' and 'Prompt' (where 'Prompt' is selected), 'TSM Admin UserID' with the value 'admin', and 'TSM Admin Password' with masked characters '\*\*\*\*\*'. Another red header bar labeled 'Communication Options' follows. Below it are several fields: 'COMPRESSION' with radio buttons for 'Yes' and 'No' (where 'No' is selected), 'COMMMethod' with the value 'TCPIP', 'TCP Port' with the value '1500', 'TCP Server address' with the value 'tsmserver', 'TCP Buffer size (Kb)' with the value '16', 'TCP Window size (Kb)' with the value '16', and 'TCP No delay' with radio buttons for 'Yes' and 'No' (where 'No' is selected). At the bottom of the window are two yellow buttons labeled 'Add/Change' and 'Remove', and a red 'X' button on the right.

You should refer to your TSM documentation for information on the additional fields which are normally specified in your TSM system user options (**dsm.sys**) file. You may use the right-arrow button over any field to show the *QuickHelp* information on each field, so information is not detailed here. However, there are some special considerations:

### TSM Server Name

You can call the server anything you like, since it is the entry in the *TCP Server address* field, not the server name, which determines how the server will be contacted. You can also configure multiple servers, each with a different name, that use the same *TCP Server address* entry.

## TSM Admin User ID/Password

You must enter the name and password of a TSM administrative user already configured on the *TSM server*. This administrative user must have been configured with either **System or Policy authority**. The administrative user ID entered will be used only by this SBAdmin application to perform management tasks on behalf of the clients. This information is never sent to or saved on the TSM client systems.

## PASSWORDAccess

If this field is set to “**generate**”, it is assumed that you have already set the password on the client using another TSM application (or have run another type of TSM backup from this client), and the server used had this option set to “generate”. In doing so, an encrypted password file was created on the *TSM client*, and will be used by this application also. In this case, you do not need to enter a **Current PASSWORD** when configuring the TSM clients.

If this field is set to “**prompt**”, the client password must be provided each time contact is made with the TSM server. The password is stored on this TSM *Admin system* for future use, and is also sent to the client and stored in an encrypted and protected file for use by SBAdmin commands. Normally, the password is contained in the client user options file (*dsm.opt*). However, SBAdmin does not use this file but supplies the password to the TSM server with each command. When using this option, you will need to enter a **Current PASSWORD** for each TSM client you configure.

## COMMMethod

This will be displayed as “TCPIP”, which is the only option supported. The only other TSM option is “shared” (shared memory), which can only be used when backing up the server itself. The shared memory option provides no significant performance increase and is not supported by SBAdmin.

## COMPRESSION

A selection of “yes” simply indicates that TSM will compress backup data on the client before sending to the server. SBAdmin provides its own compression options (see [Configuring a Backup Profile](#)). If you choose to use SBAdmin compression, then no TSM compression will be used *regardless of your selection here*. If you want to use TSM compression, you should select “yes” in this field, and do *not* indicate to use compression within your backup profile (default). Different compression schemes work best on different types of data and sizes of files. You should experiment with using both TSM and SBAdmin compression options to determine which provides the best compression with the least impact on the client system performance.

To add a new server, enter a name in the entry field at the top, add or change any of the fields on the screen, then click the **Save** button.

## Changing a Server

The information for an existing server may be changed by either:

1. Selecting [Configure→Servers](#) from the menu bar, or
2. Selecting a server icon from the [Main Screen](#) when the [Clients & Servers](#) are displayed, and pressing the **Change Server** button at the bottom of the screen.

If selected from the main screen, the [server options screen](#) will appear with the prior settings for the server. If not, select the server by typing the name at the top, or use the arrow button to the left of the entry field to select from a list of configured servers. Simply add or change any of the information on the screen, then press the **Save** button at the bottom to save the changes.

## Removing a Server

Removing a server, in this case, removes the configuration from the SBAdmin interface, but has no affect on the TSM server itself. A server may be removed only if there are no jobs currently assigned to it. If there are jobs assigned, you will be informed so, and you must [remove or change the job](#) to use a different server before the server may be removed.

To remove a server, either:

Select [Configure→Servers](#) from the menu bar, then select the server by typing the name at the top, or use the arrow button to the left of the entry field to select from a list of configured servers. Then press the **Remove** button at the bottom of the screen.

Select a server icon from the [Main Screen](#) when the [Clients & Servers](#) are displayed, then press the **Remove Server** button at the bottom of the main screen.

## 8. Configuring Boot Media Servers

A boot media server is a system used to store client CDROM ISO and network boot images created by SBAdmin. When [creating boot media](#), you will be given the option to store the images on a boot media server. When the images are successfully created, they will be copied to the specified directory on the boot media server. You will then burn the ISO to a CD/DVD and use the disc to boot a client into the system recovery process. If utilizing network boot images, then the images will be used to perform a network boot of the client into the system recovery process. Boot media is described in detail in the [SBAdmin System Recovery Guide](#).



You may have multiple boot media servers. However, only a configured [TSM client](#) may be configured as a boot media server.

### Adding a Boot Media Server

A new backup media server may be added by selecting [Configure→Servers→Boot Media Servers](#) from the menu bar. The following window will appear:

A screenshot of a dialog box titled "Add Boot Media Server". It has a text field for "Boot Media Server Name: (TSM Client)" with "stxhost1" entered. Below it is a red header "Directory for Client Network and CDROM Boot Images" and a text field containing "/storix/netboot". At the bottom are two buttons: "Add/Change" and "Remove", and a red "X" icon in a circle.

To add a boot media server, enter the **IP address or hostname** of the boot media server in the entry field at the top of the window. Note, that the boot media server must already be configured as a TSM client within SBAdmin. Specify the directory on the boot media server you wish to store the images in the **Directory for Client Network and CDROM Boot Images** field and press the **Add/Change** button to save the configuration.

### Changing a Boot Media Server

You may view or change the current configuration of a boot media server by selecting [Configure→Servers→Boot Media Servers](#) from the menu bar. Enter the boot media server name in the entry box at the top of the window, or select the arrow button to the right of the entry field and select an existing server from the list.

The settings for the server will then be displayed. If you wish to make a change to the server configuration, simply add or change any of the information on the screen, then press the **Add/Change** button at the bottom to save the changes.

### Removing a Boot Media Server

You may remove a boot media server by selecting [Configure→Servers→Boot Media Servers](#) from the menu bar. Enter the boot media server name in the entry box at the top of the window, or select the arrow button to the right of the entry field and select an existing server from the list.

The settings for the server will be displayed. If you wish to remove the server, then press the **Remove** button at the bottom of the screen. Removing a boot media server will have no effect on its client configuration but you will no longer be able to perform a network boot using this server.

## 9. Backup Profile

A backup profile is used to set default backup selections commonly used when performing backups. Assigning a backup profile to a [backup job](#) alleviates the need to repeatedly answer the same questions every time a new job is added.



At least one profile must be created. When the software is first installed, a pre-defined FULL\_SYSTEM backup profile is automatically installed. This profiles is not required if you create others, and may be removed if desired.

After creating a single backup profile, any options selected for that profile may be customized for each backup job it is assigned to. You may want to create different profiles to prevent having to change the options for different jobs.

### Adding a Backup Profile

A new profile may be added by selecting [Configure→Backup Profiles](#) from the menu bar.

There is one pre-defined profile configured when the software is installed. You may choose to edit this profile, delete it, or add new ones of your own.



The options may vary depending on the operating system support and additional features enabled. Refer to [Operating Systems Support](#) and [Enabling Optional Features](#) for more information.

The following is an example of a **System Backup** profile when **Linux**, **Solaris** and **AIX** client support is enabled:

The screenshot shows a configuration window for a backup profile named 'FULL\_SYSTEM'. The window is divided into two main sections: 'General Options' and 'Full System Backup Options'. The 'General Options' section includes fields for 'Volume Groups or Zpools to include or "all"', 'User Description' (Full system), 'Buffer Size (Kbytes)' (128), 'Pre & Post-backup Programs' (with a 'Configure' button), 'Compression Level' (radio buttons for None, Low, Medium, High), 'Rewind tape before starting job?' (radio buttons for Yes, No), 'Eject tape upon job completion?' (radio buttons for Yes, No), 'Print/Send Backup Label when completed?' (radio buttons for Yes, No, and a 'Send to:' dropdown), 'TSM Backup Read Permission' (radio buttons for Original client (owner), Any client), 'Backup process priority:' (default dropdown), and 'Retain backups:' (default days and/or default backups). The 'Full System Backup Options' section includes 'Incremental Backup Level' and 'Include as raw data:' (checkboxes for Logical/ZFS Volumes, Partitions(Linux)/Slices). At the bottom are 'Save' and 'Remove' buttons, and a red 'X' icon in the bottom right corner.

To add a new profile, enter a new **Profile Name** in the entry field at the top of the screen. A profile name may consist of any characters except a colon (:) or space (spaces will be changed to underscores).



Note that after assigning a profile to a backup job, you may customize the profile further for the specific job. Therefore, it is required that only one backup profile exists. Refer to [Configure a Backup Job](#) for more information.

Use [QuickHelp](#) at any time to display a description or instructions for a particular option. Most options are described in detail in the help information and are therefore not shown here. There are a few special considerations:

## Buffer Size

The buffer size represents the amount of data to accumulate in memory before writing that “buffer” to the backup device. In actuality, SBAdmin uses many buffers for best performance, but the amount of data written to any device at one time is set using the **Buffer Size** option.

Using a buffer size larger than the physical device can handle will result in an I/O error writing to the device, which generally varies by operating system or device driver. The default of 128K is adequate for most devices without exceeding their hardware limit. However, for best performance, especially when using high-speed tape drives, disk drives and RAID devices, you can increase this number. A value of 512 or 1024 is often best.

Note that, while not excessive, a larger buffer size will cause SBAdmin to use more memory during a backup. Also, if you use a large buffer size, you may see a backup slow down if the system is unable to write a large buffer to the device fast enough, or if there is limited memory on the system. For this reason, it's best to experiment with different buffer sizes until you find the best backup performance for your device.

## Specifying the Data to Backup

The description of the first field in the **General Options** section will differ based on the backup type you selected for this profile. In this field, you may enter the **data to backup**. This information is not required at this time and may be filled in when configuring the backup job later. Because TSM Edition only supports “full system” backup types, the type of data in this field will be either volume groups (Linux/AIX) or ZFS pools (Solaris). You may also enter “all” to include all volume groups or ZFS pools. You may also enter a list of options to *exclude*. For example, to include all volume groups EXCEPT the “tempvg” volume group, type:

```
all -tempvg
```

If you want to exclude all volume groups and ZFS pools you may leave this option blank. Leaving this option blank does have different effect depending on the type of client the backup is performed on. On an **AIX** system, leaving this option blank will still include the **rootvg** volume group (required on a base system). It will also include all volume group definitions of currently defined volume groups but will not backup the data within the excluded volume groups. On a **Linux** system, leaving this option blank will exclude all LVM data including their definitions and data. Likewise, leaving the field empty on a **Solaris** system will exclude all filesystems and volumes contained in *ZFS pools*.



If any items within the data list do not apply to a client, the item will simply be ignored. For example, using a data list containing the volume group “VolGroup00”, a client without a VolGroup00 volume group will simply skip this volume group.

## Compression Level

As noted in the Configure Servers section, there are two methods of compression which may be applied to backup data – TSM and *SBAdmin compression*. By default, no SBAdmin compression will be used (this field will be set to “None”).

A selection of “yes” simply indicates that TSM will compress backup data on the client before sending to the server. It is important to not, however, that SBAdmin provides its own compression options (see [Configuring a Backup Profile](#)). If you choose to use SBAdmin compression, then no TSM compression will be used *regardless of your selection here*. If you want to use TSM compression, you should select “yes” in

this field, and do *not* indicate to use compression within your backup profile (default). Different compression schemes work best on different types of data and sizes of files. You should therefore experiment with using both TSM and SBAdmin compression options to determine which provides the best compression with the least impact on the client system performance.

## TSM Backup Read Permission

It is important to note the **TSM Backup Read Permission** field in the backup profile because this will determine if the backup of this client (node) will be readable by another client (node). When a backup is created, it is stored in a *TSM filespace* that corresponds to whether the backup should be private (owner-access only) or shared (any node can access).

If node data should not be accessible between nodes, be sure to set this option to “**Same client only**”. Otherwise, select “**Any client**”.

Note that if you have created a backup that you wish to have installed onto different nodes, such as system replication (cloning), you must make that a shared backup. Otherwise, only the original node can access it.

## Incremental Backup Level

Using this field, you may create *incremental* (or *differential*) backups of the system. An incremental backup must be based on a level 0 (full) backup. Therefore, you must always perform a level 0 before any subsequent levels.



If you do not plan to perform incremental backups, it's best to leave this field blank to avoid unnecessary time processing incremental information for the backup.

If you set this field to “0”, then a full system backup will be performed, from which you may base additional incremental backups. Any number (1-9) indicates that you will be performing a new incremental backup, which will be based on the previous backup level.

Note that you will not be able to perform any incremental backups (levels 1-9) until you have performed at least one level 0 backup.



A Level 0 incremental (or a system backup *without* an incremental level) is the only backup from which the system may be re-installed.

A system backup with no *incremental* level specification, or a system backup with incremental level 0, is required to re-install a system. Only after the system is restored from this full system backup can you restore additional incremental backup levels. Refer to [Incremental/Differential Backups](#) for more general information and examples.

## Backup Retention Policy

By default, all backups will be retained or overwritten according to [Backup Retention Policy](#) set in the [Preferences](#) section. However, certain backups or types of backups you may wish to retain for a longer period of time. For example, you may want to retain a full backup taken at year-end for several years, while a daily backup (replaced on a daily basis) may only need to be retained for a week. Rather than choosing to retain a backup for a certain number of days, you can also choose to retain a certain number of backups of the same job.


If you set a retention policy in the profile settings, it will override the policy set forth in the **Preferences**. If you choose to [customize a profile for a specific job](#), it will apply only to backups created by that job and will override the policy for both the main profile and in the **Preferences** section.

For details on the use of the **Retain backups** field, refer to [Backup Retention Policy](#) set in the [Preferences](#) section.

After making all selections, save the profile by pressing the **Save** button at the bottom. The information will be saved and the window will be closed.

## Pre-backup and Post-backup Programs

Within the backup profile, you may configure a program to run on the client, before and/or after the backup command runs. You can also select to have programs execute before and after the creation of [snapshots](#) used for backups. This program, either a *pre-backup* program or *post-backup* program, is a custom program which exists on one or more clients, and may perform any operation, such as starting and stopping database programs, forcing users to log off the system, etc. To configure pre- or post-backup programs, press the **Configure** button next to the **Pre & Post Backup Programs** field. When doing so, the following screen will appear:

Enter programs to run on each CLIENT:	
Program to run at START OF BACKUP:	mailusers logoff 60
Program to run at END OF BACKUP:	mailusers logonok
Program to run PRIOR to creating a SNAPSHOT of each LV:	dbdown
Program to run AFTER creating a SNAPSHOT of each LV:	dbup
Enter programs to run on the SERVER:	
Program to run at START OF JOB:	setlibdev -mode seq -start 1 -dev smc0
Program to run END OF JOB	setlibdev -mode random -dev smc0
<div>Save/Return   Clear   </div>	

Note that the options for running programs prior to or after creation of snapshots are only available with backups of data contained in JFS2 filesystems (AIX), LVM logical volumes (Linux) and ZFS filesystems (Solaris).

Using the web interface is slightly different. You will notice the option to configure pre and post backup programs directly from the main profile configuration screen:

Enter programs to run on each CLIENT	
Program to run at START OF BACKUP	<input type="text"/>
Program to run at END OF BACKUP	<input type="text"/>
Enter programs to run on the SERVER	
Program to run at START OF JOB	<input type="text"/>
Program to run at END OF BACKUP	<input type="text"/>

The pre-backup and post-backup programs will be executed with **ROOT USER** authority. Therefore, they must be placed in the **DATADIR/custom** directory by the root user on the client (where **DATADIR** is the directory you selected on each system when SBAdmin was configured - i.e. **/storix**). The *custom* directory is owned by the root user and only the root user on each system has the ability to add files to this directory. The commands placed in the custom directory may be shell scripts or binary programs and must have *execute* permission.

To configure a pre-backup or post-backup program, simply add the name of the program to the profile in either of the **Pre-backup Program** or **Post-backup Program** fields. Do not enter the full path name of the program, only the file name. The program is assumed to be in the **DATADIR/custom** directory. You may also add optional arguments to the command, separated by spaces.

## Pre & Post Backup Programs

When a backup job using a profile containing client pre-backup or post-backup programs is run, the system will attempt to execute the specified program on each client before or after that client backup is performed. If the program does not exist on any client or is not executable, it will be ignored. Otherwise, it will be executed and one of the following actions will be taken depending on the exit code of the program:

	Pre-backup Program	Post-backup Program
Exit code 0	Client will be backed up and the job will continue normally.	Job will continue normally.
Exit code 1	Client will not be backed up and the backup job will be terminated with an error message	Job will terminate with an error.
Exit code 2	Client will not be backed up. If there are other clients to backup, the job will continue normally. However the job will complete with warning messages.	Job will continue normally. However, the job will complete with warning messages.
Exit code 3 or higher	Client will be backed up and the job will continue normally. However, the job will complete with warning messages.	Job will continue normally. However, the job will complete with warning messages.



A post-backup program will be executed even if the backup command that precedes it fails. This is necessary in case the post-backup program must record information about the backup or restart processes that were stopped by the pre-backup program.

## Pre & Post Snapshot Programs

When a backup job using a profile containing pre-snapshot and post-snapshot programs is run, the system will attempt to execute the specified program on each client before and/or after each snapshot is created.

The program will only be executed for the storage containers to be included in the backup, and if [Snapshot Backups](#) have been configured and the [Backup Job](#) is configured to perform snapshot backups.



The program names provided will be executed before a snapshot is created for each logical volume/filesystem. Therefore, the program must be intelligent enough to recognize the name of the logical volume or filesystem the snapshot is being created for at that time and act accordingly (or do nothing). Refer to [Creating Pre and Post Backup Programs](#) below for more information.

If the specified program does not exist on any client or is not executable, it will be ignored. Otherwise, it will be executed and one of the following actions will be taken depending on the exit code of the program:

	Pre-snapshot Program	Post-snapshot Program
Exit code 0	The snapshot of the logical volume will be created and the backup will continue.	Backup will continue normally.
Exit code 1	The snapshot will not be created for the logical volume and the backup will terminate.	The backup will terminate with an error.
Exit code 2	The snapshot will not be created for the logical volume, and the backup will continue using the active (online) data.	The backup will terminate with an error.
Exit code 3 or higher	A warning message will appear, but the snapshot will be created and the backup will continue normally.	The backup will terminate with an error.

## Creating Pre & Post Backup Programs

A customized program may perform any function on the system since it is run under *root user* authority. Any arguments or flags may be provided to the command. The same script may be called with arguments that tell the script how to proceed. For example:

<code>mypreprogram -kill</code>	may be used to log off users and
<code>mypreprogram -warn</code>	may warn users of the backup only, or
<code>mypreprogram -kill 60</code>	may warn users, then log them off after 20 seconds, etc.

In many cases, it is desirable for the program to have certain information about the backup job. The program may want to display or save information about the backup job in another application or file, or a post-backup program may need to respond differently depending on whether the backup was successful or not. Every program will have access to the following environment variables:

<b>STX_CLIENT</b>	The name of the client
<b>STX_SERVER</b>	The name of the TSM server
<b>STX_DEVICE</b>	The name of the device on the server (API if written to TSM server)
<b>STX_JOBID</b>	The Job ID
<b>STX_BACKUPID</b>	The Backup ID
<b>STX_EXITCODE</b>	The exit code of the backup command or job
<b>STX_SNAPLVNAME</b>	The logical volume/filesystem for which a snapshot is created.
<b>STX_SNAPFSNAME</b>	The filesystem name (mount point) of the snapshot This will show a dash "-" if the snapshot is not a filesystem

The **STX\_EXITCODE** variable is only used in client post-backup/job programs. This indicates the success or failure of the backup.

The software is installed with sample script programs that may be used for any client or server pre-backup, post-backup or pre/post snapshot program. The programs are called "**prepost.sample**" and "**prepostsnap.sample**" and will simply display the values of all of the above variables when the backup job is run. You may edit or view the contents of this script file (contained in the **DATADIR/custom** directory), which contains additional details on the use of this option.

## Incremental/Differential Backups

An *incremental backup* is one in which the only data to be included in the backup is that which has changed since the prior incremental backup level. An incremental backup level can be from 0 to 9, where 0 is a "full incremental" backup from which all other levels are based. Levels 1 through 9 indicate that only data that has changed since the last **prior-level** backup should be included.

*Differential backups* are also incremental backups, except that backups include a cumulative list of files that have changed since a certain time. This is achieved by running the same incremental level backup repeatedly, backing up the same files that changed since the last prior-level (or level 0) backup, along with any additional files that have changed since the last time the same incremental level backup was run. The result is that the backup gets continually larger each time it is run, until a prior level (or level 0) backup is run again.

Raw devices such as *logical volumes (AIX)* and other partitions (slices or *ZFS volumes* on **Solaris**, meta-disks on **Solaris & Linux**, etc) that do NOT contain mounted filesystems will always be backed up in their entirety if they have been written to since the last backup of a prior level. This assumes that you selected to "**Include as raw data**" this information in the backup profile. If included, we assume in the examples below these raw devices will be included with the backups as well as the "files".

### Incremental Backup Examples

1. Consider the following backup schedule:

<b>Monday</b>	<b>Level 0</b>
<b>Tuesday</b>	<b>Level 1</b>

<b>Wednesday</b>	<b>Level 2</b>
<b>Thursday</b>	<b>Level 3</b>
<b>Friday</b>	<b>Level 4</b>

- a. On Monday, the entire system will be backed up. Note, however, that only the volume groups indicated in the backup profile will be included, if applicable.
  - b. On Tuesday, only the files that have changed since Monday's backup will be included in the incremental level 1 backup.
  - c. On Wednesday, only files backed up since the last **prior-level backup** (level 1) will be included in this backup.
  - d. Likewise on Thursday and Friday.
  - e. On the following Monday, a new incremental level 0 is performed, backing up all data once again. This is the new backup from which all subsequent backups will be based. Any incremental backups performed prior to this level 0 will be considered obsolete.
2. In a second example, consider the following backup schedule, which is often referred to as **differential** backups since we're effectively backing up the differences between the system as it is now versus a specific day in the past :

<b>First day of the Month</b>	<b>Level 0</b>
<b>Each Friday night</b>	<b>Level 4</b>
<b>Each other weekday</b>	<b>Level 7</b>

- a. On the first day of every month, regardless of the day of the week, a full incremental backup is performed.
- b. The next day, an incremental level 4 will be performed (if Friday) or an incremental level 7 will be performed (if Monday through Thursday)

In this example, keep in mind that it is not necessary to perform a level 1 backup after a level 0, since each level (1-9) will backup the data from the last **prior-level** backup performed, even if it was several levels prior. Therefore, if your last level was 0 (full), then either a level 4 or a level 7 will backup the same data. However, if your last level was 4, a level 7 will always backup files changed only since the last level 4.

In addition, each weekday the *same* backup level will be performed. Since all data will be backed up since the last **prior** level, your previous day's backup of the same level will become obsolete.

3. This example is a **differential** backup, where all backups are based on the most recent level 0 (full) backup that was performed:

<b>Every Friday night</b>	<b>Level 0</b>
<b>Monday through Thursday night</b>	<b>Level 1</b>

- a. Every Friday night, a full backup level 0) is performed.
- b. On every other night, a level 1 backup is performed. The result is that, each day, all files that have been created or changed since the Friday night backup will be backed up again. The size of the backup will grow each day until after the next Friday night backup is again performed.

## Restoring from Incremental Backups

If re-installing the system from the backup, you must always restore from a level 0 incremental backup (or one that did not use an incremental level). The system installation process will not allow you to select an

incremental level (1-9) to restore from. Only after the system has been reinstalled and rebooted will you be able to restore additional incremental levels using the SBAdmin interface.

From a full-system backup, you can restore files, directories, filesystems or specific volume groups onto a running system. If your system backup is an incremental backup and you choose to restore filesystems or volume groups, the backup will be restored as an incremental backup as described below:

There are a few things to remember when restoring from incremental backups in order to get your data back to the most recent state:

- a. Always start by restoring from your most recent incremental level 0. This will remove and replace all files in each filesystem.
- b. Always restore full **Volume Groups/ZFS Pools** or **Filesystems** from incremental backups. If you choose to restore a *directory* from a full-system backup, all files will be restored from the backup, but changes will not be re-applied, such as re-removing files which had been removed prior to that incremental backup level.
- c. Restore incremental levels in the order they were performed **ONLY** if the next incremental level to restore is more recent than the last. For instance, if you performed a level 1 backup most recently, do not restore a level 2 backup which is older than your level 1.
- d. When you perform the same incremental backup level multiple times without performing a lower-level, restore only the most recent backup of that level. Any prior versions of the same backup level are considered obsolete.

In the first backup example above, you must restore each backup, starting with level 0 in the order of each backup level, stopping when you encounter a backup level that is older than this predecessor. If your level 1 backup was most recent, then you will need to restore only level 0 and 1. If your level 4 was most recent, you will need to restore all levels 0 through 4.

In the second example, you are ensured never to have to restore more than three backups to get your data up-to-date. This convenience comes with some complication when restoring. First, you must of course always start by restoring your last level 0. Then, if there was a higher level backup performed after your level 0, restore it next (it could be a 4 or 7 depending on what day is the first day of the month). Lastly, if you restored a level 4 and there was a level 7 backup performed after your level 4, restore it next.

## Changing a Backup Profile

The information for an existing profile may be changed by selecting [Configure→Backup Profiles](#) from the menu bar. The [profile options screen](#) will then appear. Either enter the name of the profile in the field at the top of the screen, or select the arrow button to the left of the entry field and select an existing profile from the list.

The profile settings will then be displayed. Simply add or change any of the information on the screen, then press the **Save** button at the bottom to save the changes.

## Removing a Profile

A profile may be removed from the system only if it is not assigned to any backup jobs. If it is assigned to a job, you will be informed so, and you must [remove or change the job](#) to use a different backup profile before the current profile may be removed.

To remove a profile, select [Configure→Backup Profiles](#) from the menu bar, enter or select the profile to remove, then press the **Remove** button at the bottom of the screen.

# 10. Exclude Lists

Exclude lists are used to exclude certain files, directories, or devices (such as partitions or logical volumes) from backup jobs. You may create any number of different exclude lists, and assign *one or more* exclude lists to a particular [backup job](#). You may also select which clients the exclude list will apply to. This allows you to use an exclude list for a job, but still have it only apply to certain clients if multiple clients are backed up by the same job.

Note that you can specify the volume groups to include or exclude (i.e. “all –appvg”) in your backup job. It is therefore not necessary to exclude a volume group or its contents using an exclude list if it was not included on the job. Using an exclude list as described in this section, however, will provide the ability to exclude specific files or directories within the filesystems.

Exclude lists may be used to exclude files, directories, entire filesystems or *device data* (such as partitions or logical volumes) from your full-system backup. *Wildcard* characters (\*) in exclude list entries may also be used to exclude may files or directories matching a certain pattern.

Device names may also be added to the exclude list. A device name may be an LVM *logical volume*, *meta-disk* (software RAID) device name, or disk *partition*. The data within the device will only be excluded if it is not used for a filesystem. To exclude a filesystem, you must exclude the filesystem mount point (directory).

## Using Wildcards

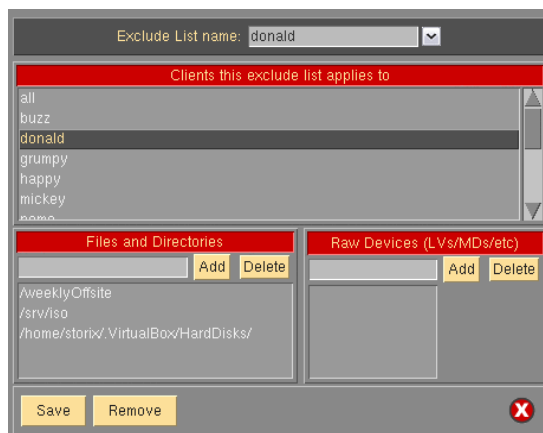
If you wish to exclude a directory, all files within the directory as well as any sub directories will also be excluded. A **wildcard** (\*) may be used in an exclude list entry for files and directories. For instance, having **/usr/local/\*.old** in the exclude list will exclude all files in the /usr/local directory with a “.old” extension. Wildcards in the exclude list work the same as at the command line. For example, typing “ls /usr/local/\*.old” will yield the same list of files that will be excluded if **/usr/local/\*.old** is in the exclude list. You may specify multiple wildcards in the same string. For example, “/\*local/x\*.old” will exclude files starting with an “x” and ending with “.old” in the /usr/(*anydir*)/local directory.



You may not use other special characters in exclude list entries, even if they exist in the names of the files to exclude. Those characters are \$, +, ? and ^, which have special meaning to the system.

## Adding an Entry to the Exclude List

Select [Configure→Exclude Lists](#) from the menu bar to display the following **exclude list screen**:





You may enter a new **Exclude List name** in the entry field at the top of the screen, or select an existing exclude list name using the arrow button to the left of the entry field. When doing so, the current settings for the selected exclude list, if any, are displayed.

In the first (**Clients**) listbox, you may select “all” to apply this exclude list to all *clients* (when assigned to a backup job), or select individual clients the exclude list should apply to. Note that, if this exclude list does not apply to a particular client, that exclude list will not appear as a selectable option when configuring a backup job. If, however, the exclude list is applied to a client, this does not automatically apply to all jobs. You must also select to use the exclude list (or lists) when [configuring a backup job](#).

To exclude files or directories, type the file or directory name (or wildcard string) in the entry field under the **Files and Directories** heading. To add a *logical volume, partition (Linux), slices and ZFS volumes (Solaris) or meta-disk (Linux/Solaris)* to the exclude list, enter the device name (do not prefix with /dev) in the entry field under the appropriate heading. Note that the heading will only show the device types that are supported for the various client operating system types enabled.

Press **Enter** or select the **Add** button next to the corresponding entry field to add the item to the list.

When all selections have been made, press the **Save** button at the bottom of the screen to save the entries and clear the entries. To undo all changes made, press the [cancel button](#) at the bottom.

## Removing Entries from the Exclude List

To remove an entry from the exclude list, display the exclude list screen by selecting [Configure→Exclude Lists](#) from the menu bar and selecting the exclude list to change. Then, to remove a file or directory entry, select the item in the **Files and Directories** listbox and press the **Remove** button next to the file or directory entry field. Likewise, to remove a logical volume from the list, select the item in the **Raw Devices** listbox and press the **Remove** button next to the entry field. When you have removed all desired selections, press the **Save** button at the bottom of the screen to save the remaining entries and exit. To undo all changes made, press the [cancel button](#) at the bottom.

To remove an entire exclude list, select [Configure→Exclude Lists](#) from the menu bar, enter or select the exclude list at the top of the screen, then press the **Remove** button at the bottom of the screen. Note that, when removing an exclude list that is assigned to current backup jobs, the exclude list will be removed from the job configuration. You will be informed if the exclude list is assigned to any jobs before proceeding.

# 11. Backup Jobs

A backup job must be created before any backup may be performed by the *admin system*. The job information will identify the TSM server and one or more clients to backup and the backup profile. If the backup is to be scheduled to run either at a later time or on a regular basis, the dates and times are also added to the backup job information. Temporary backup jobs which are run only once may also be set to be automatically deleted once the job has completed.

Before configuring a backup job, you must first have configured at least one [TSM Client](#) to backup and a [TSM Server](#) to backup to (even if the client and server are the same). There must also be at least one System [backup profile](#) (a default profile comes installed with the software). On the job configuration screen, you can customize the selected backup profile to apply changes which apply only to the job, if desired.

## Creating a Backup Job

To create a backup job, either

1. Select [Configure→Backup Jobs](#) from the menu bar, or
2. Press the **Add** button on the [Main Screen](#) when the [Job Information](#) is displayed.

The following **Configure Backup Job** will be displayed:

The screenshot shows the 'Configure Backup Job' dialog box. At the top, 'Job ID' is set to 'stxhost2\_level0' and 'Server Name' is 'TSM@tsmsserver01'. The 'Backup Profile' section shows 'FULL\_SYSTEM' with a 'View/Customize' button. 'VG(s) or Zpool(s)' is set to 'all' and 'User Job Description' is 'Full system'. The 'Clients' section lists 'stxhost2', 'stxhost1', 'stxhost2', and 'stxhost3'. The 'Backup Schedule' section has 'Regularly' selected, with 'Month(s)' set to 'all', 'Day(s) of month' to 'all', 'Day(s) of week' to '1', 'Hour(s) of day' to '1', and 'Minute(s)' to '0'. The 'Job-Specific Options' section includes 'API' for 'Backup Device', 'Use exclude list(s)', 'Delete job after running', 'Perform snapshot backups', 'Encrypt data?', 'Verify backup when complete', and 'Create boot media on client and store on server'. At the bottom are buttons for 'Save', 'Remove', 'Copy', 'Rename', 'Run Now', and a red 'X' button.

To create a new backup job, enter the **Backup Job ID** in the entry field at the top. The Job ID is used as unique identifier for this job, and may consist of any letters or numbers except for a colon (:) or space (spaces will be automatically replaced with an underscore).

Next, you must select an entry in the **Server Name** field (see below). Additional required fields include the **Profile Name** and the **Clients** to backup. All other settings will provide a default value. If you did not define the **VG(s) or Zpools(s) to include** (or all) in the backup profile, you may need to enter this information now.

More details on the various entries which follow are described below. Remember, you may use [QuickHelp](#) anywhere on this screen for specific instructions or information on a specific option.

When all selections are complete, press the **Save** button at the bottom of the screen to save the profile and clear the current selections.

## Selecting the Server or Device

Using the arrow button to the right of the **Server Name** field, you will get a pop-up list of all TSM servers and one addition entry "**local (client tape)**". When selecting "**local (client tape)**" you may only select a single *Client*, and the *Backup Device* will be **SBTAPE**. Refer to [Creating a Local System Backup](#) below for more information.

If you select a *TSM Server*, you may select one or more clients to backup as part of the backup job, and the **Device Name** field will be disabled.

## Selecting/Customizing the Backup Profile

You must assign a [backup profile](#) to the job. The profile will determine the specific backup options which apply to the backup type. Refer to the [Volume Groups to Include](#) in the [Backup Profiles](#) section for additional information. After selecting a profile, the **Volume Groups to Backup** and **User Backup Description** fields will be filled in automatically from the profile information (if provided there). You may override the profile data by simply changing the information in those fields. This will not change the information in the original profile.

If you want to change any of the default backup settings from the profile, you may select the **View/Customize** button. This will display the [profile options screen](#) and allow you to make any changes that will apply only to this job. You may use this option, for instance, to turn on SBAdmin backup compression (thereby overriding the TSM compression) even though other jobs that use the same profile will be unaffected. You can also use this option, to change only the **Incremental Backup Level** so that all incremental backups, even those at different levels, can use a single backup profile.

## Selecting Clients to Backup

If you selected a TSM Server to backup to, you must make one or more selections from the **Clients** listbox. If you selected to backup to local tape, you may select only one client from the list. The selections will be displayed in the **Name(s)** entry field to indicate the order in which the client backups will be performed. If you want to change the order of the backups, just de-select and re-select the clients in the listbox until they appear in the desired order.

If you selected "**local (disk/tape)**" in the **Server** field, then you may only select one client from the list, since that client will be sending the backup to its own local tape drive.

## Additional Options

Answers to the following question buttons may be used to override the default actions taken during a backup:

- **Delete job after running:** This option is only available when a backup job has been configured to run "*Later*", or once-only. If so, check this option to have the job configuration removed from the system upon completion of the backup job. This is useful if you are creating temporary backup jobs that are never to be used again.
- **Perform snapshot backups:** This option is only available if snapshot backups have been configured for one or more of the selected clients. By default, all backups are performed using the active (online) copy of a filesystem or logical volume (even when snapshot backups have been configured). To create snapshots of each logical volume before backing it up, check this button.

Refer to [Snapshot Backups](#) for details on the configuring filesystems and logical volumes to be backed up using offline mirror copies.

- **Encrypt data:** This option is only available if a **Backup Data Encryption Feature** license is installed and encryption support is enabled for all of the clients selected above. Refer to [Enabling Encryption Support](#) in the client configuration to add encryption support for a client. After selecting this button, the entry field to the right will become available. In this field, you must enter the encryption key ID which has been configured on the client. You may not save the job information with this option selected until you have entered the valid name of an encryption key for each selected client.

For information on configuring encryption keys on the client, refer to [Enabling Backup Data Encryption for a Client](#) and the **stkeys** command.

- **Use exclude list:** This option is only available if there is at least one exclude list configured, which applies to at least one of the selected clients. If you select this button, indicating that you wish to use an exclude list, the arrow button to the right will be enabled. You may press the arrow button to select one or more *exclude list name(s)* to use, which will be shown in the box. Click outside the list to complete the selections. To perform the backup without excluding any data, simply un-check this button.

Note that exclude lists are cumulative, meaning that you can select multiple lists, and the entries in all lists will be combined into a single list when the backup job is performed. Any entries (files, directories, or devices) that do not exist on one or more of the selected clients. If this is the case, that exclude list item will simply be ignored.

- **Verify backup when complete:** If you want to automatically verify a backup by re-reading the data from the TSM server once the backup completes, check this button.

## Scheduling the Backup

The [Backup Schedule](#) box to the right of the screen contains entry fields for backups that are to be scheduled. You need to indicate in the section when the backup should be performed:

1. **Upon Demand** - Selecting this option will save the job information but only run when you choose to do so manually. When selecting this option, all other options in this box will be disabled.
2. **Later** - The job will be run only once at a specified date and time. You will need to enter in the remaining fields a single date and time the backup should run.
3. **Regularly** - The job will be scheduled to run on a regular basis on specific days and times. You may enter multiple options in each of the date and time fields to have the backup run multiple days per week, only on certain days of the week, or even multiple times in a single day. When this option is selected, you may also press the **Exceptions** button to specify certain days, contrary to your backup schedule, on which the backup should NOT run. Refer to [Configuring Backup Exceptions](#) section for more details.

If you set the backup to run only "**Upon Demand**", all other fields in this section will be grayed out and no entries will be accepted. Otherwise, you must enter information into these fields indicating when the backup is to be run. The easiest way to enter the data into these fields is by pressing the arrow to the right of each field and selecting from the popup list.

If the backup is to run "**Later**", only one option may be selected from each list.

If the backup is to run "**Regularly**", more than one option may be selected in each field, and there will be an "*all*" option at the top of the **Month** and **Day of Month** fields, and an "*any*" option will appear for **Days of Week** field. Selecting "*all*" in both the month and day of month fields indicates the job should run on all days of all months. Select "*any*" for the day of week field to indicate that the job should run on any day of the week. Otherwise, the job will run only on the days of week indicated. Note that, if you make an entry in the

**Days of Week** field and the **Days of Month** field is not set to "all", then the job will be run on the specified days of the month **only** if they occur on the specified days of the week.

## Creating a Local System Backup

It's possible to setup a backup job to perform a *System Backup* of a client to its own locally-attached tape drive. You must have previously configured a [Tape for Local System Backup](#) for the client before configuring a local System Backup Job.

To create a **Local System Backup**, select [Configure->Backup Jobs](#). Enter a name in the **Job ID** field, then choose "**local (client tape)**" from the **Server Name** field.

The screenshot shows the 'Configure Backup Job' dialog box. At the top, 'Job ID' is 'stxhost2\_tape' and 'Server Name' is 'local'. The 'Backup Profile' section shows 'FULL\_SYSTEM' selected. The 'Backup Schedule' section has 'On Demand' selected, with a note 'Schedule not applicable. Job will be run upon demand.' The 'Clients' section lists 'stxhost2' as the selected client. The 'Job-Specific Options' section shows 'SBTAPE' as the backup device, with options for 'Delete job after running', 'Perform snapshot backups', 'Create', 'Use exclude list(s)', 'Encrypt data?', and 'Verify backup when complete'. The bottom bar contains buttons for 'Save', 'Remove', 'Copy', 'Rename', 'Run Now', and a close button (X).

After choosing "**local (client tape)**" you will [Configure the Backup Job](#) as usual, with the following exceptions:

1. Only *System Backup* profiles will be available for selection.
2. You may select only one client since the backup will be sent from the client to its own local media.
3. Only a device named **SBTAPE** (backup to local tape) will be available, and only if previously configured.

Refer to [Tape for Local System Backup](#) in the [Client Configuration](#) for more details on configuring local system backup media.

## Changing a Backup Job

To change information for an existing backup job, either:

1. Select [Configure->Backup Jobs](#) from the menu bar, then type or select the **Job ID** at the top of the screen.

2. If the [Job Information](#) is displayed on the [Main Screen](#), select the icon for the job to change and press the **Change** button at the bottom of the screen.

The current job settings for the selected job will appear. Make all desired changes to the information on the screen, then press the **Save** button to save the changes clear the selections.

## Copying a Backup Job

To copy a configured backup job to a new job id, either:

1. Select [Configure→Backup Jobs](#) from the menu bar, then type or select the **Job ID** to copy at the top of the screen.
2. If the [Job Information](#) is displayed on the [Main Screen](#), select the icon for the job to copy and press the **Change** button at the bottom of the screen.

The current job settings for the selected job will appear. Make all desired changes to the information on the screen and press the **Copy** button. You will be prompted with a new pop-up window for the job ID to copy the configuration to. After typing in the new job ID, press the **Copy** button and the job will be copied to the new job ID. Note that if you made changes to the options of the original job and did not save them, then these changes will only be applied to the new job ID.

## Renaming a Backup Job

To rename a configured backup job to a new job id, either:

1. Select [Configure→Backup Jobs](#) from the menu bar, then type or select the **Job ID** to rename at the top of the screen.
2. If the [Job Information](#) is displayed on the [Main Screen](#), select the icon for the job to rename and press the **Change** button at the bottom of the screen.

The current job settings for the selected job will appear. Make all desired changes to the information on the screen and press the **Rename** button. You will be prompted with a new pop-up window for the job ID to rename the configuration as. After typing in the new job ID, press the **Rename** button and the job will be renamed as the new job ID. Note that if you made changes to the options of the original job and did not save them, then these changes will be applied to the new job ID.

## Removing a Backup Job

To remove a backup job, the job may not currently be in a [job queue](#). A job will only be in a job queue if it is currently running, waiting to be run, has been placed on hold, or had previously failed.

To remove a backup job, either:

1. Select [Configure→Backup Jobs](#) from the menu bar, then type or select the **Job ID** at the top of the screen, then press the **Remove** button.
2. If the [Job Information](#) is displayed on the [Main Screen](#), select the icon for the job to remove and press the **Remove** button at the bottom of the screen.

## Running a Backup Job on Demand

Any backup job, whether it is currently scheduled or not, may be run at any time. There are several ways to start a job running:

1. Select [Configure→Backup Jobs](#) or [Actions→Run a Backup Job](#) from the menu bar, then select the Job ID at the top of the screen and press the **Run Now** button.
2. If the [Job Information](#) is displayed on the [Main Screen](#), select the icon for the job to run and press the **Run** button at the bottom of the screen.
3. If the job is currently at the top of a [job queue](#) but is not running because it had previously failed or was placed on hold, [display the job queues](#) on the [Main Screen](#), select the queue in which the job is placed, and then press the **Restart** button.

For the first two options, "running" the job actually just places the job in the [job queue](#). If there are no other jobs in the same queue, the job will start running immediately. If another job is running to the same device, this job will be placed in a "Pending" state until the prior job finishes. If a prior job had failed, it will remain in the queue and block other jobs from starting. The failed job must therefore be either restarted or removed from the queue to allow jobs behind it to start.

## Adding a Job to the Queue from the Command Line

Even if the [SBAdmin Interface](#) is not running, scheduled jobs will automatically be placed in the queue at their scheduled times, and the queues will be processed and jobs in each queue will be run on a first-come first-serve basis. It is also possible to manually add jobs to the queue without using the Backup Administrator interface. To add a job to the queue, refer to the **stqueue** command in the [Commands Reference Guide](#).

## Running a Backup Job from the Command Line

It is possible to run a backup job from the command line, bypassing the job queues, by using the **strunjob** command (refer to the **strunjob** command in the [Commands Reference Guide](#)). The [SBAdmin Interface](#) need not be running. Note that the job will start immediately and may interfere with other jobs writing to the same devices since the queues are not used. If you wish to add the job to the queue from the command line, so that it will run only when the TSM server is available, refer to the section [Adding a Job to the Queue from the Command Line](#).

# 12. Holidays

There may be days of the year, even days of the month, that you don't want any of your backup jobs to run. For instance, on holidays there may have been no activity on the system, and there may not be anyone available to insert new backup cartridges in the tape drive. You may schedule **Backup Exceptions** or "Holidays" from performing backups.

There are actually two ways to do this, on a job-by-job basis, or for all backup jobs. To set exceptions for all backup jobs, select [Configure→Holidays](#) from the menu bar. To set exceptions for a specific job, press the **Exceptions** button in the **Backup Schedule** section of the [Job Configuration Screen](#). The respective screens will be displayed as follows:

The first screenshot shows a window titled "No backups will be performed on the following dates unless explicitly overridden in the backup job configuration:". It contains a table of dates and "Clear" buttons:

05/29/06	Clear	07/04/06	Clear
09/04/06	Clear	11/23/06	Clear
11/24/06	Clear	12/25/06	Clear
	Clear		Clear
	Clear		Clear
	Clear		Clear
	Clear		Clear
	Clear		Clear
	Clear		Clear
	Clear		Clear
	Clear		Clear
	Clear		Clear

At the bottom are "Save" and "X" buttons.

The second screenshot shows a window titled "Job ID: daily\_offsite". It has checkboxes for "Exclude GLOBAL holidays" (checked), "Exclude first day of every month", and "Exclude last day of every month". Below these is a section titled "Exclude specific days (format=MM/DD/YY):" with a table of dates and "Clear" buttons:

	Clear		Clear
	Clear		Clear
	Clear		Clear
	Clear		Clear
	Clear		Clear
	Clear		Clear
	Clear		Clear
	Clear		Clear
	Clear		Clear
	Clear		Clear
	Clear		Clear
	Clear		Clear

At the bottom are "Save" and "X" buttons.

In the first screen, you may enter one or more dates on which ALL backup jobs will be excluded from running. In the second screen, you may enter additional dates in the date fields that will be excluded for this job in addition to those excluded on global holidays. Since it may be cumbersome to enter the dates by hand, and since the dates may be dependent on the day of the week, it is useful to have a calendar handy. By pressing the calendar icon next to each date field, a calendar will appear such as the following:

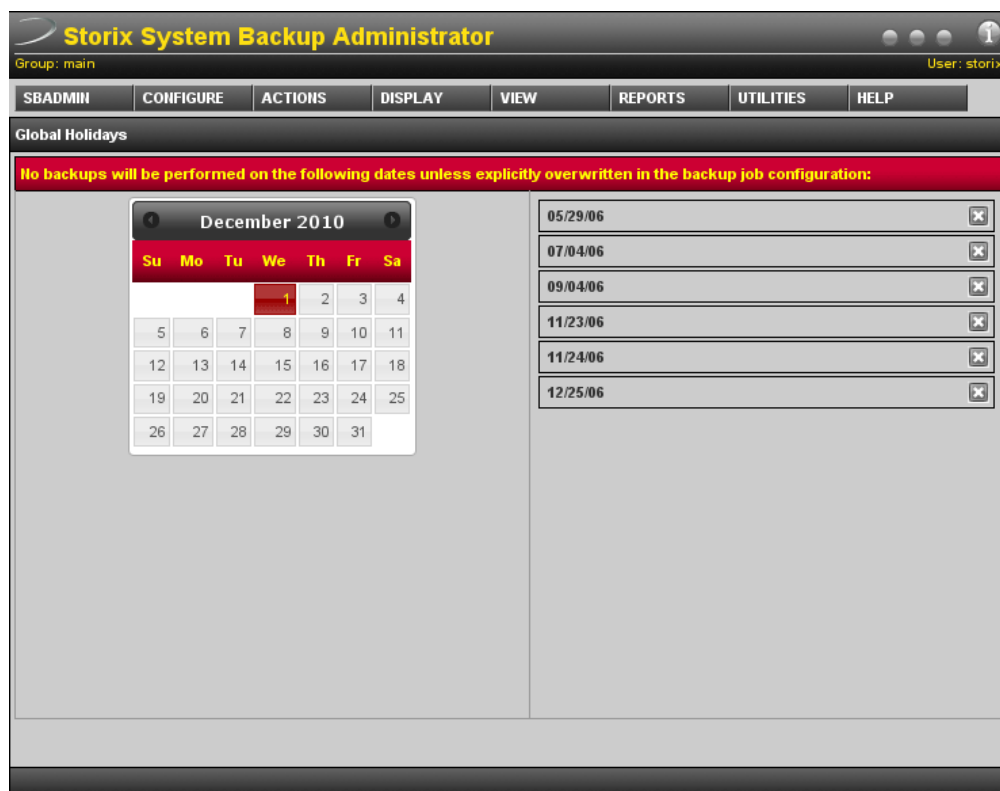
Sun	Mon	Tue	Wed	Thu	Fri	Sat
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30

At the bottom are "<<Prev", "Next>>", and a red "X" button.

If you press a specific date on the calendar, that date will be automatically inserted into the date field and this window will close. You may press either the **<<PREV** and **NEXT>>** buttons to change the calendar to the previous or next month and select a date from that calendar.



When using the SBAdmin Web Interface the screen presented will look slightly different. To add a holiday, simply click on the date from the calendar. The date will be added to the list on the right. Any dates appearing on the right are automatically saved. To remove a holiday, simply click the **X** next to the date.



In the **Backup Schedule Exceptions** (by job) window, the following options may also be selected:

1. **Exclude GLOBAL holidays:** This box is always checked by default, meaning that global holidays apply to this job as well. If you un-check this box, then the global holidays which apply to other jobs will not apply to this job, and the job will therefore run on those holidays if the job schedule permits. You may press the **Define** button next to this field to bring up the **Global Holidays** window and make changes to the global holidays if desired.
2. **Exclude the first day of every month:** Since there may be a monthly backup set to run on the first day of the month, you may not need this job to run on the same day. If not, select this box, which is the same as adding the first day of every month in the date fields.
3. **Exclude the last day of every month:** Since there may be a monthly backup set to run on the last day of the month, you may not need this job to run on the same day. If not, select this box, which is the same as adding the last day of every month in the date fields.

When all selections and entries have been made, press the **Save** button to save the dates and options. The backup job (or jobs) will no longer run on the specified dates.

# 13. Snapshot Backups



Snapshot feature is available only for **AIX** systems running AIX 6.1 and later, for **Linux** data contained in LVM logical volumes, and **Solaris** data contained in ZFS datasets.

SBAAdmin provides an option of creating a “*point-in-time*” backup of data contained in logical volumes and filesystems. This is typically referred to as a **snapshot backup**. Although the feature is available for AIX, Solaris and Linux systems, the internal process differs to some extent:

- For **Linux**, a LVM *snapshot logical volume* is created for each logical volume to be backed up. Snapshots may be created for any logical volume, whether or not it contains a filesystem. This snapshot LV is generally smaller than the original LV, but large enough to contain any changes which occur to the original logical volume for the duration of the backup.
- For **AIX**, snapshots are available only for logical volumes containing *JFS2* (Extended JFS) filesystems. For **AIX 6.1**, only internal snapshots are supported (i.e. snapshots are recorded within the logical volume itself), and at **AIX 6.2** and later, either internal or external snapshots may be used (external snapshots created a temporary snapshot logical volume similar to Linux snapshots described above).
- For **Solaris**, snapshots are available on ZFS filesystems and ZFS volumes. Snapshots may be created for any dataset, whether or not it contains a filesystem.

As the backup is performed, original data to be changed by another process is first copied to the snapshot device (or internal snapshot area for AIX 6.1), and the data from the snapshot device is backed up in place of the changed data. When the backup is complete, the snapshot is simply removed. Any process which reads or writes data to the original device (or filesystem within) during the backup will use the most up-to-date data, while the backup contains only the original data as it was when the backup began.

## Enabling Snapshot Backups

Snapshot backups are configured on each client a backup will be performed. On each client, you may specify each logical volume/ZFS dataset for which a snapshot is created, or you may indicate that all logical volumes/ZFS datasets will use snapshot backups, when possible.



Although logical volumes and filesystems may be configured to allow snapshot backups, a snapshot will not be created by default when a backup job is run. You must also select to *Perform Snapshot Backup?* from the [job configuration screen](#) before a snapshot backup will be performed.

To enable snapshot backups, select the following from the menu bar:

[Configure→Snapshot Backups](#)

The configuration screen will appear as in the following sample:

Client name: donald

Device	Size (%)	FStype	Mount Point
<input type="checkbox"/> all			
<input checked="" type="checkbox"/> donald/home	15	ext3	/home
<input type="checkbox"/> donald/iso		ext3	/srv/iso
<input type="checkbox"/> donald/root		ext3	/
<input type="checkbox"/> donald/srv		ext3	/srv
<input type="checkbox"/> donald/vmware		ext3	/home/storix/vmware
<input type="checkbox"/> donald/woody-backups		ext3	/woody-backups

When backing up this client, create snapshots of filesystems:

☒ One at a time (sequentially) ☐ At the same time (concurrently)

If snapshot cannot be created:

☒ Use active filesystem ☐ Abort the backup

Additional options (based on OS and Filesystem type):

Chunk size (Kbytes) 64

Save Remove Settings

First, select the client for which to configure snapshots by pressing the arrow next to the **Client name** field. After doing so, a list of logical volumes/ZFS datasets on that system will be displayed in the second listbox.

You must either select the individual device for which snapshots may be created, or select “**all**”. If “all” is selected, snapshots will be permitted for all applicable devices.



Again, you must also select to **Perform Snapshot Backup?** from the [job configuration screen](#) before a snapshot of a logical volume or filesystem will be created.

The options which follow indicate the action the backup process should take when performing snapshot backups:

### 1. **Size (%):**

For each logical volume (or for “all” if selected), indicate the size of the snapshot as a percentage of the original LV. The size needed will depend on the amount of data that is changed within the original LV while the backup is in progress. It is very important to create the snapshot large enough that it does not run out of space.

### 2. **Chunk size (Kbytes):**

Use the arrow to the right of the entry field to list and select from a valid chunk size. Valid sizes are from 4 Kbytes to 1024 Kbytes (1 megabyte).

A “chunk” is the unit in which the original logical volume will be divided when tracking changes to the LV when a snapshot is used. Each time a chunk is changed for the first time, the original chunk is copied to the snapshot LV in its entirety, then referred to instead of the original by the backup process.

When determining the best chunk size to use, there is a trade-off: The larger the chunk, the fewer writes to the original LV it will take to fill up the snapshot LV (since larger chunks of data must be copied, even when only a small piece of data is changed). The smaller the chunk, the more individual copies must occur as the original data is changed, which may have a greater impact on system performance during the backup. The default of 64 Kbytes is sufficient for most purposes.

### 3. **When backing up this client, create snapshots of filesystems:**

- a. **One at a time (sequentially).** Select this option if a snapshot should be created individually when the data in that logical volume (or filesystem) is to be backed up. When the backup of this LV completes, the snapshot is removed (*resyncd*). This option is recommended if there is no relational data between different logical volumes and filesystems that must be backed up at the same *point-in-time*.

Less disk space is required since only one snapshot LV is created at a time. For **AIX 6.2** using internal snapshots, no separate logical volume is created, so the added space does not apply. But, in any case, when creating and removing snapshots one at a time, the snapshot exists for a lesser time, reducing the amount of data written to it, thereby decreasing the possibility of running out of space in the snapshot.

- b. **At the same time (concurrently).** Select this option if a snapshot of all logical volumes to be included in a backup should be created at the same time. This is important if there is relational data between different logical volumes and filesystems that require that the data from all logical volumes be backed up from the same *point-in-time*. For the reasons described above, this option is not recommended if there is no relational data between different logical volumes.

#### 4. If a snapshot cannot be created:

- a. **Use active filesystem.** If this option is selected, then the failure to create a snapshot of the logical volume or filesystem will result in the backup using the original (online) copy without a snapshot. The result would be the same as if snapshot backups were not configured for this logical volume or filesystem.
- b. **Abort the backup.** Select this option if the client backup should abort when a snapshot cannot be created.

If **concurrent** snapshot backup is performed, all snapshots will be removed and the backup of the client will terminate, but the job will continue processing other client backups, if any.

If **sequential** snapshot backups are performed, no snapshots will exist at this point, but there may have already been some data written to the backup media. Therefore, both the backup and job will terminate, preventing other backups from continuing to write to the backup media.

Possible issues preventing a logical volume or filesystem snapshot from being created include:

- 1 ) A snapshot LV already exists for the logical volume. Another snapshot backup may not have removed the snapshot due to a program failure, or another (non-SBAdmin) process may have created a snapshot LV.
- 2 ) There may not be enough space in the volume group to create the snapshot logical volume. If this is the case, you need to expand the volume group, remove other unused logical volumes, or select to create smaller snapshots using the [Size \(%\)](#) option.

When all selections have been made, press the **Save** button. The settings for the selected client will be saved and you may then select a different client for which to configure snapshot backups.

If you wish to remove prior settings for a client, select the **Remove Settings** button. If selected, the prior configuration will be removed and no backups performed on that client will use snapshot backups, even if the [backup job configuration](#) indicates that snapshots should be used.

# 14. Job Queues

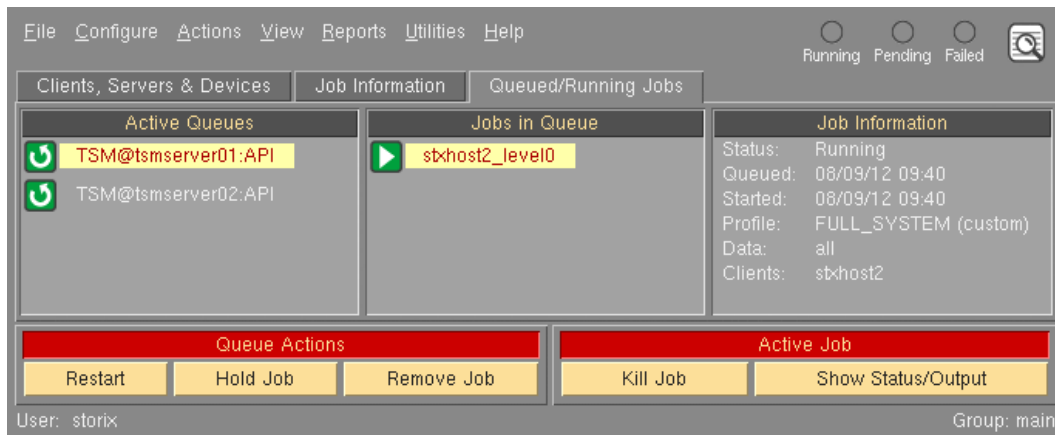
When jobs are run, they are actually placed in a **job queue**. A job queue will exist for each *TSM Server*. A queue will also appear for any client backups performed to local tape.

Jobs sent to a TSM server will run concurrently. However, the number of concurrent backups to a server may be limited by the maximum number of [Concurrent Backups](#) setting. If exceeded, remaining jobs will be placed in a “pending” state until other backup jobs complete.

Jobs sent to a **local tape** device will always run sequentially to prevent device conflicts. Although it would be unusual to have more than one system backup scheduled for a single client at the same time.

## The Job Queue Display

Job queues may only be displayed or manipulated from the [Main Screen](#). The following is an example of the **Job Queue Display**, which may be shown by selecting [Display→Job Queues](#) from the menu bar or simply the **View Queues** button on the status bar:



The left-most display area contains the names of the job queues *for which at least one job exists*. If there are no jobs either running or stopped in a queue, the queue will not be displayed. The name of the queue is the same as the name of the TSM server with *TSM@* prefix, and local client backups will show the client name followed by the tape device name (*SBTAPE*). To display the jobs within a queue, select the icon corresponding to the desired queue. When doing so, the selected queue will be highlighted in and the jobs in that queue will be listed in the center display area.








The center area contains the jobs currently in the queue. The jobs are placed, and will be run, in the order they were added to the queue. To show a summary of the job information for a job, click on the icon corresponding to the Job ID. The job information will appear in the display area to the right and the selected job icon will be highlighted.

The [status bar](#) at the bottom also shows the status of jobs in the queue. If the **Running** light is **green**, at least one backup job is currently running. The **Pending** light displays **yellow** if there are queued jobs that have not yet run because they are waiting on another job or for the server to become available. And the **Failed** (**red**) light aluminates if there is a failed job in the queue (usually preventing other jobs from running).

The [action buttons](#) at the bottom of the screen will apply to the selected queue or selected job.

## Icons on the Job Queue Display

The icons for the queues and jobs display a symbol representing the status of the queue or job. The following is a list of possible status icons that may appear:

-  A queue in which a job is currently running
-  A queue in which a job has failed (click on queue and job icons to see why)
-  A job that is currently running
-  A pending job (waiting for a prior job to complete)
-  A job that has failed (click on icon to display job information)
-  A job placed on hold by the user
-  Job is waiting for a server to become available before starting


The status of a queue or queued job is checked every few seconds and the icons are automatically updated with the new status, if changed. When a job has completed successfully, the icon for the job is removed from the screen. Once the last job in a queue has completed successfully, the queue icon is also removed from the screen.

## Monitoring Backups

By selecting a backup job on the Main Screen and then pressing the **Show Status/Output** button at the bottom of the screen, you can view the backup in progress, or information about a failed backup.

### The Backup Status Screen

A detailed status report of a job that is currently running, or one which has failed may be displayed at any time by pressing the [Status Report](#) button at the bottom of the [Job Queue Display](#). The status screen for the currently selected job will be displayed such as the following example:

Job ID: all_clients Server: TSM@tsmserver01 Device: API							
Client	Estimated		Actual		Remaining		Performance
	Megabytes	Minutes	Megabytes	Minutes	Megabytes	Minutes	Kbytes/Sec.
stxhost1	2673	10	2673	10	0	0	4199
stxhost2	2235	5	537	1	1698	4	7441
stxhost3							
Backup progress: <div><div></div></div>							24 %
Hide Output	Show Label	Print/ Send	Backup Currently Running				


The Job ID and Server are shown at the top of the screen. The middle section will contain a set of boxes for **each client** in the job. The corresponding client is indicated in the button at the far left. The additional fields and buttons on the screen correspond to the client selected. Select a [client button](#) to display the [progress bar](#), time and performance information, or backup output (using the additional button) for a particular client.

Next to each client button is a list of values, indicating the approximate progress of the backup. This shows the **estimated** time and size of the backup, the **actual** time elapsed and amount of data written so far, and

the **remaining** time and data to be written. Note that these values apply to each corresponding client. If a client backup has not yet started, its progress values will not be shown.

The **progress bar** is seen below the client information and shows a graphical representation of the percent of the backup that has completed. Again, this applies only to the selected client backup. To view the status bar for a different client backup, press the desired **client button**.

Job ID: all_clients Server: TSM@tsmsrver01 Device: API							
Client	Estimated		Actual		Remaining		Performance
	Megabytes	Minutes	Megabytes	Minutes	Megabytes	Minutes	
stxhost1	2673	10	2673	10	0	0	4199
stxhost2	2235	5	537	1	1698	4	7441
stxhost3							

**Backup progress:**  24 %

[Hide Output](#)
[Show Label](#)
[Print/Send](#)
Backup Currently Running
✖

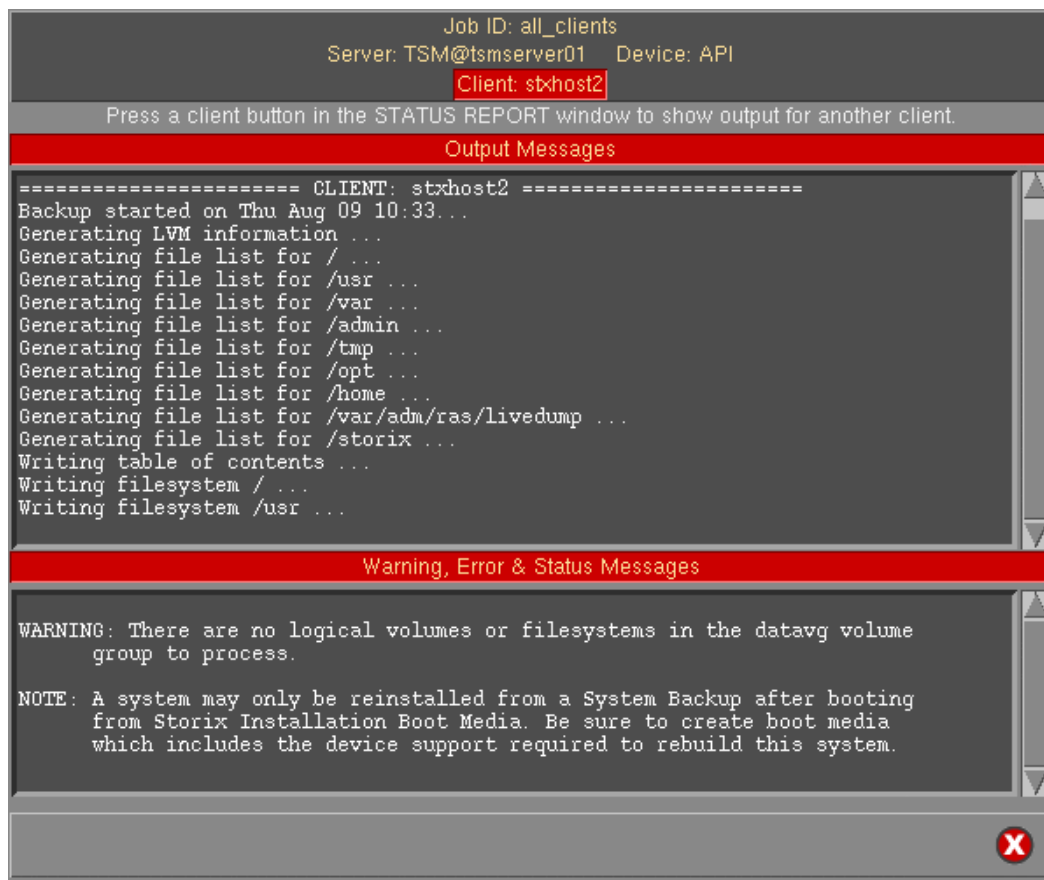
At the bottom of the status screen are more buttons for displaying additional information:

- The **Show Output** button is described in the [Backup Output Display](#) section below. This applies only to the backup of the selected client.
- The **Show Label** button will allow you to view the current contents of the media label, which will include only those client backups that have completed, as well as any prior jobs written to the same media, if any. Refer to the [Backup Labels](#) section for a sample and information on the label contents.
- The **Print/Send** button will allow you to send a report to the printer with the contents of this window as well as the [Backup Output Display](#) for all clients assigned to this job.
- The **Show Verify Status** button will only appear if you selected to automatically verify the backup data when the backup completed in the job settings. If the verify was performed, or is in progress, the verify progress is already shown, and the button will appear as **Show Backup Status** instead. When selected, the progress bar will change from **Backup progress** to **Verify status**, and vice-versa, and the corresponding progress values will be displayed in the section above. If the option to automatically verify the backup was not selected with configuring the backup job, this button will not be shown.

Use the [cancel button](#) on the lower right corner to close this window. The information will continue to be updated and may be redisplayed at any time, **even after the backup job has completed**.

## The Backup Output Display

The **Show Output** button on the bottom left corner of the [status report screen](#) will display the backup messages for the *selected client*. These might include status messages, warnings or error messages. Any time a backup job fails after the backup begins, this is the button you would use to find out why. The following is a sample output screen:



Scrollbars are provided to the right of each display panel in case the output exceeds the size of the panel. The **Job ID**, **Server** and **Client** are shown at the top of the screen. To view the backup output for a different client, select the desired client button on the [status report screen](#). You may press the [cancel button](#) at the bottom to close this window. It may be redisplayed at any time, **even after the backup has completed**.

Using the [SBAdmin Web Interface](#) the [Backup Status Screen](#) and backup output messages are combined into a single screen as shown below:



**Storix System Backup Administrator**

Group: main
User: storix

SBADMIN
CONFIGURE
ACTIONS
DISPLAY
VIEW
REPORTS
UTILITIES
HELP

Status/Output: Backup Currently Running

Clients	Estimated		Actual		Remaining		Performance
	Megabytes	Minutes	Megabytes	Minutes	Megabytes	Minutes	Kbytes/Sec.
buzz	1554	3	1554	3	0	0	8606
grumpy	1156	2	1156	2	0	0	8456
happy	1226	3	1226	3	0	0	5411
mater	831	1	831	1	0	0	7603
mickey	1084	4	1084	4	0	0	3778
pluto	1896	6	333	1	1563	5	5330
stitch							

Backup Progress

17% Complete

**Output Messages**

```

----- CLIENT: pluto -----
Backup started on Wed Dec 01 11:20...
Generating file list for /etc /usr ...
Sending backup information to server nemo ...
Writing file/directory /etc /usr ...

```

**Error Messages**

Show Label

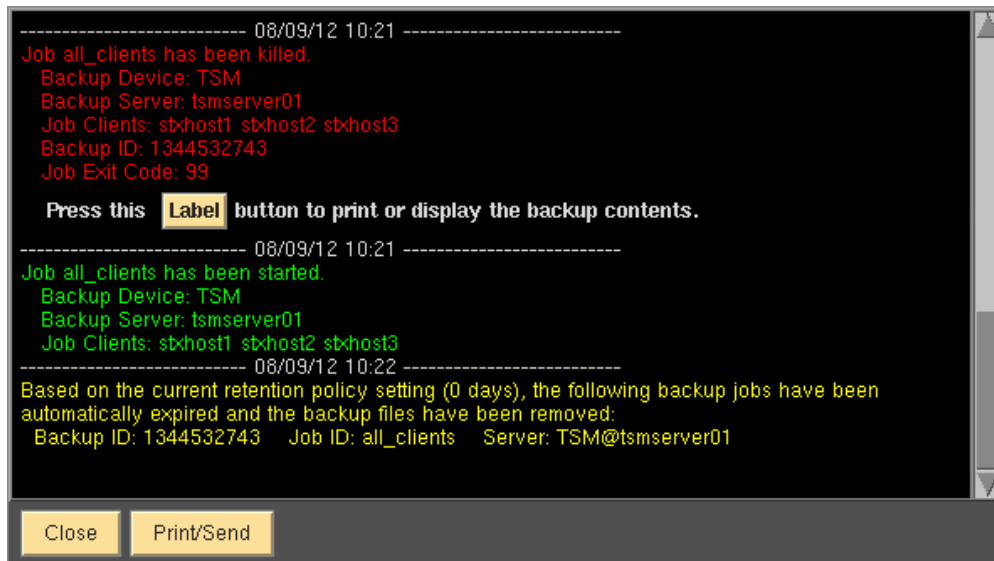
## The Job Message Screen

Since many jobs run automatically after being scheduled to run at a certain date and time, there may not always be a person watching the screen when a job is started. Therefore, as jobs are run, the queuing system keeps an updated list of messages on the screen, showing which jobs have run, which have completed, and which jobs have failed (and why).



The Job Message screen will only appear if the SBAdmin user interface is running. If not, messages are logged and can be displayed the next time SBAdmin is started. Refer to the [Backup Status Notification](#) section for more information.

The following is an example of this **job status message screen**:



A scrollbar is provided to the right to scroll up and down the messages. This screen may only be displayed if the Backup Administrator application is running. When you **Close** this window, the messages will be removed from the log and cannot be displayed again.

If a job completes successfully, or if it fails after having begun the backup, a **Label** button will appear within the text of the message. By pressing this button, the media label will be displayed, which provides a summary of the contents of the media, both for the current job and any prior jobs, if any. Refer to the [Backup Labels](#) section for a sample and information on the label contents.

This window appears each time a new message is posted. Once the window is closed using the [Cancel button](#), it will not be possible to view the previous message contents.

## Manipulating Backup Jobs

To change the status of a job in the queue, you must select the queue and job on the [Job Queue Display](#) screen. The [action buttons](#) at the bottom of the screen under the [Queue Actions](#) and [Active Job](#) headings then apply to the selected jobs. The following functions may be performed:

### Kill a Running Job

Jobs that are currently **running** may be killed, or *canceled*, by selecting the **Kill Job** button from the Main Screen when the [Job Queues](#) are displayed. A signal is sent to the job telling it to terminate. Depending on the current backup operation being performed, this may take a little time. Once the job has been killed, a message will appear on the [Job Message Screen](#) indicating that the backup has been terminated.

A backup job which was killed may have already created a Backup Label. If so, the label will indicate any client backups that have already completed, and will show the backup job status as failed. If no backup completed, you may want to remove the label at this time. To do so, display the label either by selecting the **Label** button in the [Job Message Screen](#) or the [Backup Status Screen](#).

### Place a Job on Hold

A job which is currently in the **pending** state may be placed on hold by pressing the **Hold Job** button from the Main Screen when the [Job Queues](#) are displayed. When a job is placed on hold, it will not run when any prior backups complete, but will remain in the queue waiting to be manually started.

## Restart a Job

A job which is either on **hold**, had previously **failed**, or had been **killed**, may be started, or restarted, by pressing the **Restart** button from the Main Screen when the [Job Queues](#) are displayed. Jobs that are restarted after they have failed or had been killed will restart from the beginning of the job, even if one or more of the client backups had completed.

## Remove a Job from the Queue

Any job, except a running job, may be removed from the queue by pressing the **Remove Job** button from the Main Screen when the [Job Queues](#) are displayed. After doing so, the selected job is removed from the queue and its icon will disappear. If this was the last remaining job in the queue, the queue icon will disappear as well.



Removing a job from the queue does not delete the job itself. The job will remain on file and can be scheduled or run manually at another time.

## Show Status/Output

You can display the [Backup Status Screen](#) for the selected job by pressing the **Show Status/Output** button. Here you will see the progress indicator for the job. On that screen you can select a client to display, then press the **Show Output** button to display the [Backup Output Display](#) for the backup for the specified client.

# 15. Backup Labels

A [backup label](#) is generated for each backup that is started at the beginning of a tape as well as for any backups stored to TSM servers. These labels are used to keep track of the contents of the backup for use when verifying or restoring data at a later time. The backup label contains a summary of the contents of the backup media, which may include multiple client backups within each job. Also, for each backup, status information is recorded, including the backup time, size of the backup and the output of the backup commands. This backup information is kept on file for as long as the backup label is also available.

Note that, for backups to local tape, the backup media may contain multiple tape volumes. If a new backup job is appended to an existing backup tape, that backup information is appended to the same backup label.

[Backup labels](#) are not the same as [Tape Labels](#). A tape label is a unique identifier assigned to each individual tape, allowing the backup label information to be obtained given a tape label ID. The tape label IDs for tapes used within a backup are also shown in the backup label. Note, however, that tape labels must be placed on the tape before they are used in a backup. Refer to the option [Write a Tape Label ID to a Tape](#) in the [Utilities](#) section for details on tape labels

The following is an example of a backup label for a job written to a TSM Server containing multiple client backups:

```
*****
*   Backup ID: 1344532917   *
*****
Date: Thu Aug 09, 2012 10:21 AM
Backup Server: TSM@tsmserver01
Backup Device: API
          (API -> TSM)
-----
JOB ID      BACKUP TYPE  DESCRIPTION
all_clients Full System   Full system

  SEQ#  CLIENT    RUN DATE/TIME  STATUS    VOLS  DATA
    1  stxhost1  08/09/12 10:22 Completed   1-1
    2  stxhost2  08/09/12 10:33 Completed   1-1  rootvg datavg
    3  stxhost3  08/09/12 10:38 Completed   1-1  rpool

JOB EXIT: Successful
```

Print/Send    Expire/Remove    [X]

The **Backup ID** appears at the top. This ID is a unique identifier generated automatically for each label and is also stored on the backup media itself. This way, it is possible to read the Backup ID from the backup media and reference its contents in the label information. Also at the top of the label is the date the label was first created, and the **server** the backups were written to.

If the backup was to local tape, the **Tape Label ID** for each volume is shown at the bottom of the label. The tape label IDs will only be shown in the backup label if a previous backup containing tape labels overwritten by this backup, or if the option [Write a Tape Label ID to Tape](#) was used prior to writing this set of backups.

Use the **Print** button to send a copy of the backup label to the printer. You will always know the contents of the tape without reading it if you have a copy of the label with each backup tape.

The **Expire/Remove** button is used to expire, or remove, the backup label from the system. This should be done only when the tape will be discarded or reused. Refer to [Expiring a Backup Label](#) below for details.

## Automatically Printing Backup Labels

After a backup job completes, the backup label created or associated with that job may be automatically sent to any printer queue configured on the admin system. This may be accomplished by setting an option in the [Backup Profile](#) configuration for the profile assigned to the job. Note that you must have configured the printer queue before using this option.

To print backup labels upon completion of a backup job, follow these steps:

1. Select [Configure→Backup Profiles](#) from the menu bar.
2. Select the profile name to change, then press the **Save** button.
3. For **Print Backup Label upon completion**, press the button to indicate “Yes”.
4. Next to the **Print queue** field, press the down-arrow button to list and select a printer queue.



If you want to print only the backup labels for certain backup jobs, you may also customize the backup profile for a job instead of setting a printer queue for all jobs using the profile. Refer to [Selecting/Customizing a Backup Profile](#) in the [Job Configuration](#) section for details.

## View Backup Labels

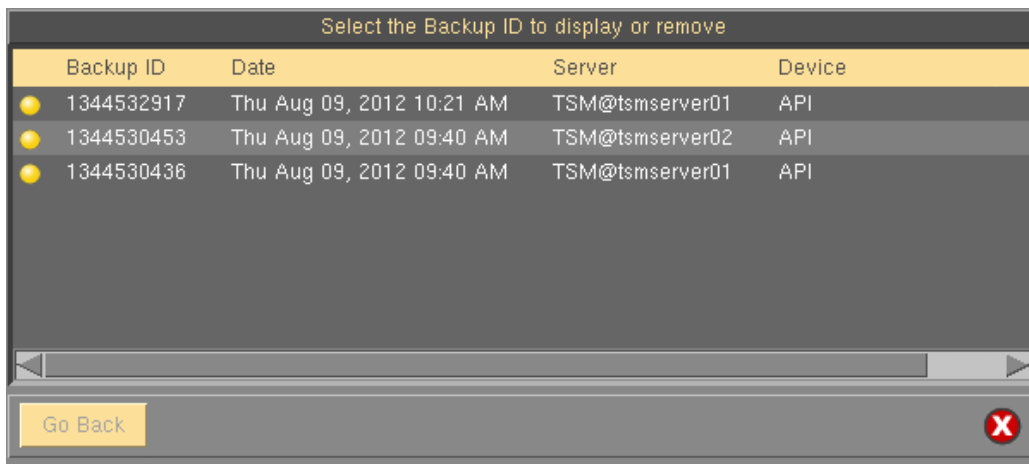
Because it is often desirable to view a backup label, there are many places within the application where the backup label may be displayed:

1. A label for any completed backup may be displayed at any time by selecting [View→Backup Labels](#) from the menu bar on the [Main Screen](#). Since there are many ways to search for the desired label, this option is explained in detail below.
2. When a backup completes or fails, a message is displayed in the [job message screen](#). If this screen is not already visible, it will be displayed automatically any time a job message is posted. If the backup job completed successfully or failed after the backup had started, a **Label** button will appear on the message screen. When pressed, the label is displayed on the screen.
3. When displaying status of a backup that has completed or is still in progress, a **Show Label** button is provided at the bottom of the [status report screen](#). By pressing this button, the label for the media on which the backup is being placed is displayed. In this case, the label will not contain information for backups that are still running.
4. When displaying the status of a job that is being verified or a backup that is being restored, a **Show Label** button is provided at the bottom of the [status report screen](#). By pressing this button, the label for the media being read is displayed.

A history of backup labels is stored on the *admin system*, and may be displayed by selecting [View→Backup Labels](#) from the main menu bar. Several options are available for finding the backup label you want to display:

### View by Backup ID

Select [View→Backup Labels→By Backup ID](#) from the menu bar. A list of all labels will be displayed as shown below:



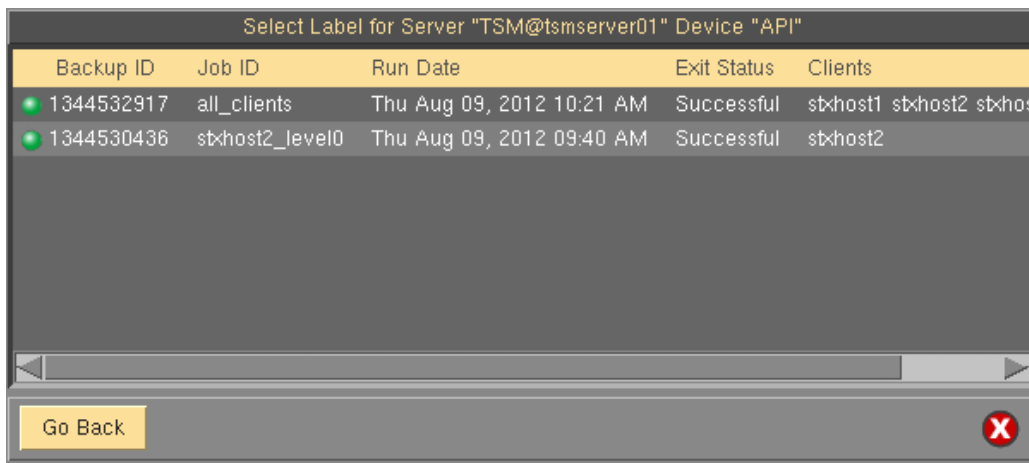
This list could become very lengthy if there are a lot of labels on file. To display the detailed label information, click on the button to the left of the desired Backup ID.

## View by Tape Label ID

To display the backup label in which a physical tape was used, select [View→Backup Labels→By Tape Label ID](#) from the menu bar. A list of tape labels currently associated with backup labels is displayed. Only tape labels for which the tape ID was written to the tape prior to its use within a backup will be shown.

## View by Server

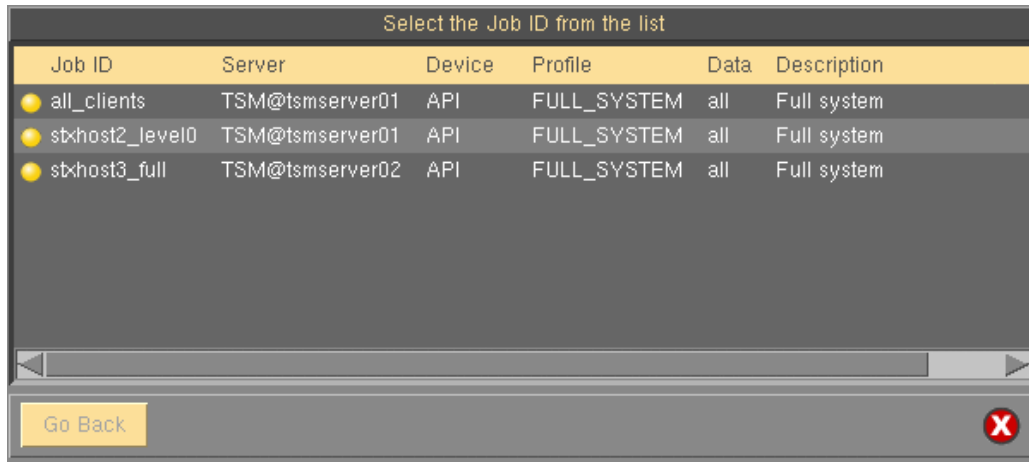
Select [View→Backup Labels→By Server](#) from the menu bar. A list of servers is displayed. Note that, if you performed a client backup to local tape, the client would be considered the server. Backups to TSM servers will be shown with the “TSM@” prefix. Select a server from the list to continue. Once you do so, a list of backups for the selected server is displayed, as shown below:



Note that the color of the button represents whether the backup was successful (**green**) or failed (**red**). A **yellow** button indicates that the job completed successfully, but with warning messages. The Job ID, date and time, and a list of clients on the media are displayed for each label in the list. To display a label, click the button next to the Backup ID. The label will be displayed ([see above](#)). If you want to return to the server and device display screen, press the **Go Back** button. Otherwise press the [cancel button](#) to close this window.

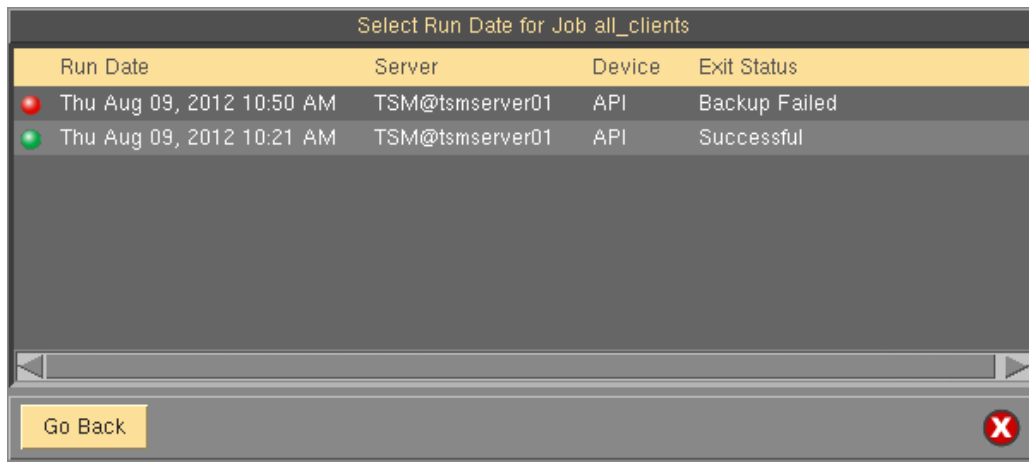
## View by Job ID

Select **View→Backup Labels→By Job ID** from the main menu bar if you want to select the label to display from a list of Job IDs. The following screen will be displayed:



Job ID	Server	Device	Profile	Data	Description
all_clients	TSM@tsmsserver01	API	FULL_SYSTEM	all	Full system
stxhost2_level0	TSM@tsmsserver01	API	FULL_SYSTEM	all	Full system
stxhost3_full	TSM@tsmsserver02	API	FULL_SYSTEM	all	Full system

Select the desired job. An additional list will display, showing the dates the job has been run:

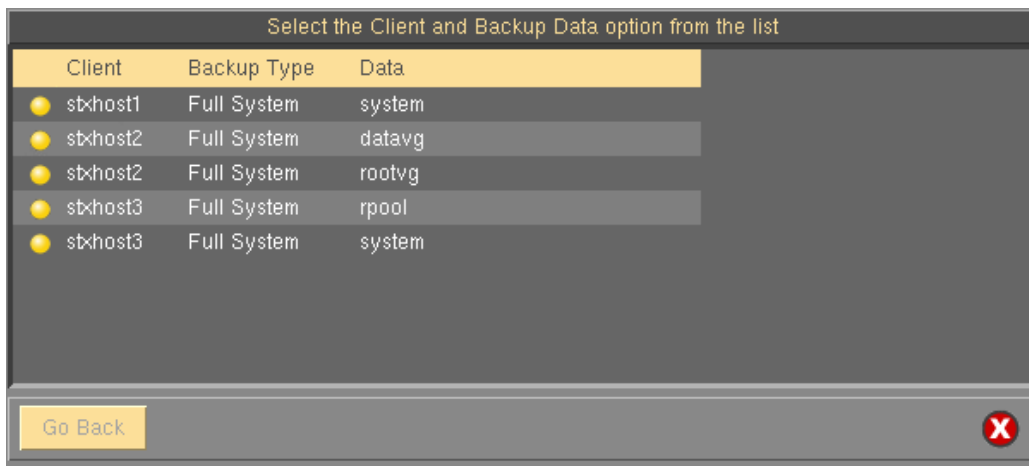


Run Date	Server	Device	Exit Status
Thu Aug 09, 2012 10:50 AM	TSM@tsmsserver01	API	Backup Failed
Thu Aug 09, 2012 10:21 AM	TSM@tsmsserver01	API	Successful

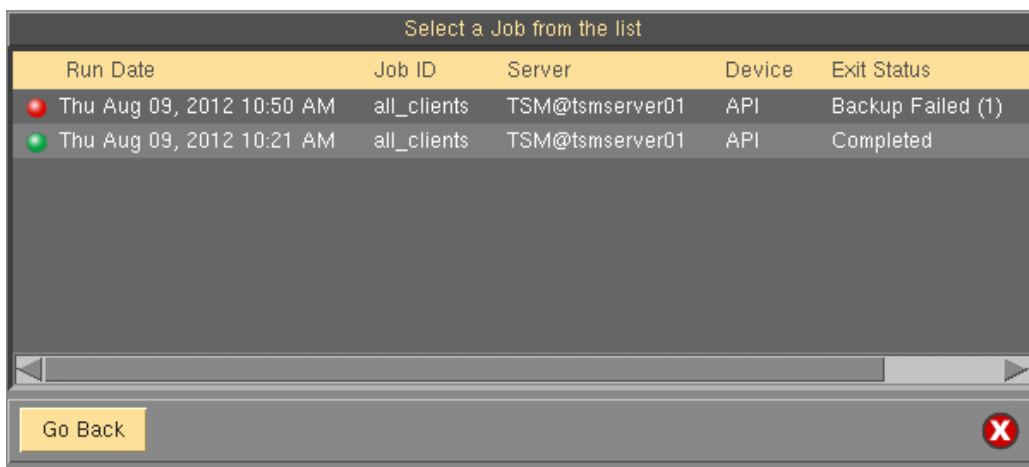
Note that the color of the button represents whether the backup was successful (green) or failed (red). The Job ID, date and time, and a list of clients on the media are displayed for each label in the list. To display a label, select a specific **run date** from the list. The label will be displayed ([see above](#)). If you want to return to the job display screen to select a different job, press the **Go Back** button. Otherwise press the **cancel button** to close this window.

## View by Client

Select **View→Backup Labels→By Client** from the main menu bar if you want to select the label to display from a list of backups performed by client. This option is particularly useful if you want to know the last time a certain client or a certain *volume group* on the client was backed up. After selecting this option, a list of clients and each volume group backed up from the client is displayed similar to the following example:



Select the button next to the client and volume group you wish to display. An additional list of specific backup dates for the selected client and backup data (i.e., volume groups, zpools) will be shown:



Note that the color of the button represents whether the backup was successful (green) or failed (red). The Job ID, date and time, and a list of clients on the media are displayed for each label in the list. To display a label, select a specific **run date** from the list. The label will be displayed ([see above](#)). If you want to return to the client list to select a different client, press the **Go Back**. Otherwise press the **cancel button** to close this window.

## Read from Server

This option may also be used to view the backup label associated with a TSM backup on the server. Since it reads the backup label IDs from the server, it may also be used to rebuild the backup label on the *admin system* if it was previously expired (and the backup on the TSM server was not removed).

To do so, follow these steps:

1. Select **View→Backup Labels→Read from Server** from the menu bar. A window similar to the following will display:



2. Use the arrow button to select a **Server name**. If you want to read a backup label from a backup performed to a client's local tape drive, select the "**local (client tape)**" option at the top of the list. In this case, the **Original Client (owner)** field will change to **Client Name**, and a new field, **Device Name** will appear.
3. If you selected a *TSM Server*, use the arrow button to select the **Original Client (owner)**. All backups are stored on the server in a *TSM filespace* specific to each client, so you must know the original client (node) the backup was created for.
4. If you selected **local (client tape)** in the **Server name** field, you must select the **Client Name** and the **Device Name (SBTAPE)** from which to read the backup in the fields provided.
5. Press the **Select** button next to the **Backup ID** field to display a list of backup images on the server for the client. If the icon next to the label is **yellow**, this indicates that there is no backup Label ID on the admin system for that backup. Select a backup image from the list to read.
6. Select the **Read Label** button.

The backup is read and the label information will be displayed if it exists.

If the label information for the backup is not found on the *admin system*, an error message will appear. This indicates that the label was **expired**, so no detailed information on the tape contents is available. Normally, the backup is removed from the TSM server when a backup is expired. Sometimes, however, the label may have been accidentally deleted from the admin system. If this is the case, you will need to rebuild the backup label. Refer to [Rebuild \(unexpire\) a Backup Label](#) for more information.

## Expiring a Backup

TSM backups may become obsolete and need to be occasionally removed to free space on the server. This is referred to as "**expiring**" a backup. When backups are no longer valid it is necessary to get rid of the backup label and backup status information.

By default, the [Backup Retention Policy](#) prevents TSM backups and backup tapes associated with a current **backup label** from being overwritten by new backup jobs. When a backup is expired, the label information is destroyed and the backup is removed from the server. In the case of tapes, the tape is not affected, but may be overwritten by a new backup. For TSM server backups, the overwrite policy determines if backup jobs should overwrite an existing backup or create an additional backup on the server. For tape backups, the overwrite backup determines whether a tape containing a current backup label may be overwritten.



If a **local tape** backup has been expired or the label history has been inadvertently removed from the system, it is still possible to rebuild this information. Refer to [Rebuild \(unexpire\) a Backup Label](#).

**Very important note:** If you expire a backup from the **TSM server**, the actual backup will be removed from the TSM server. You are given ample warning before the backup is removed, and once it has been remove it will no longer be possible to access that data.

## Manually Expiring a Backup

To manually expire a backup, first perform any one of the various methods to [view the backup label](#). Then select the [Expire/Remove](#) button at the bottom of the screen.

## Automatic Expiration of Backups

The [Backup Retention Policies](#) determines if and when an old backup may be overwritten by a new backup. Any time an old backup is overwritten by a new one, the previous backup label must be expired as the data the label points to will no longer exist.

For **tape** backups, if the **Tape Overwrite/Retention Policy** has been set to allow current labels to be overwritten by new backup jobs, the backup being overwritten will be **automatically expired**, allowing the tape to be overwritten by a new backup.

For **TSM** backups, expiration of the backup label also means removing the actual backup image files from the server. The **TSM Backup Retention Policy** determines when a prior backup can be automatically expired.

The TSM retention policy only applies when writing a new backup using the same backup job. When this occurs, the policy may allow:

1. no backups to be expired, removed or overwritten without [manual expiration](#).
2. automatic expiration of backups using the same job that are older than a certain number of days
3. expiration of a backup only if there are a minimum number of un-expired backups of the same job remaining.

# 16. Backup Job Status & Output History

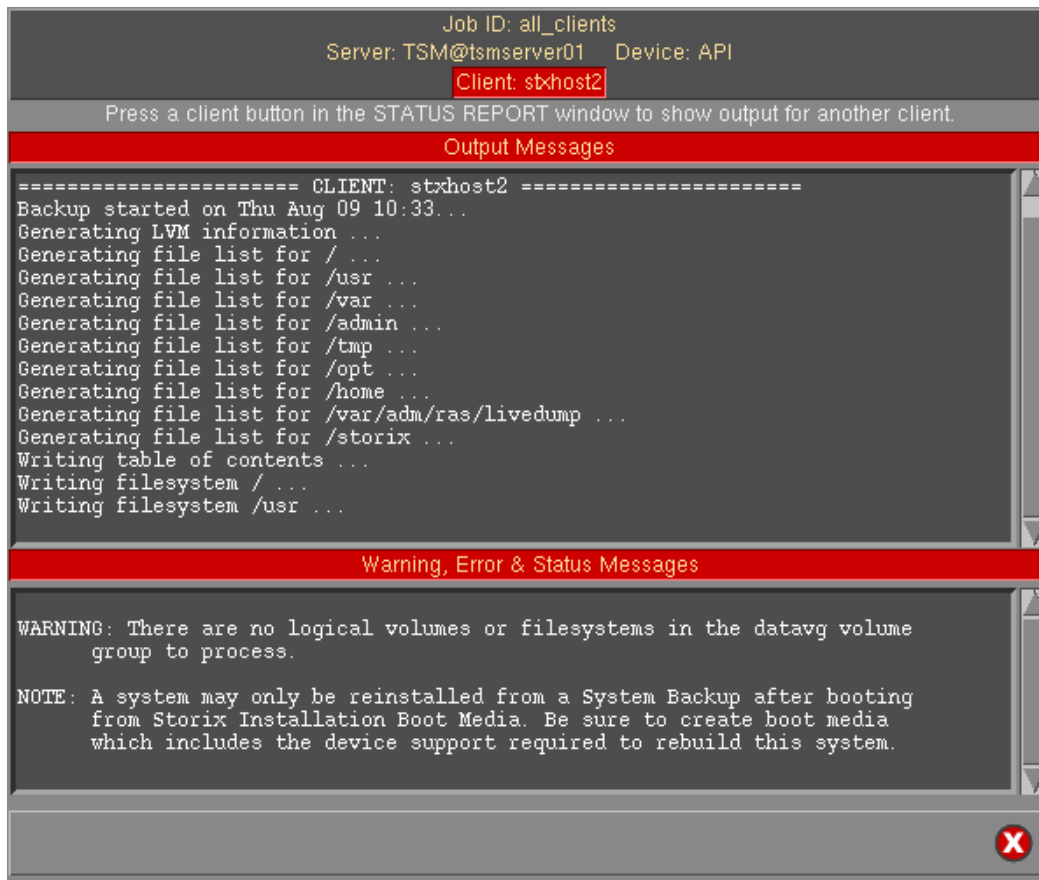
The job status and backup output, which may be displayed while a backup is running, is kept on file as long as the backup label for the job exists. Therefore, it is possible to view this information long after the backup has completed. The screens which appear are identical to those that may be displayed while the backup job is running, as shown in the following sample screens:

The following is the [Backup Status Report Screen](#) which may appear by selecting one of the following:

1. Select the **Show Status/Output** button on the [Job Queues Display](#)
2. Select the **Status/Output** button on the [Job Information Display](#)
3. Selecting [View→Backup Status/Output](#) from the menu bar (as described throughout this section)

Job ID: all_clients Server: TSM@tsmserver01 Device: API							
Client	Estimated		Actual		Remaining		Performance
	Megabytes	Minutes	Megabytes	Minutes	Megabytes	Minutes	
stxhost1	2673	10	2673	10	0	0	4199
stxhost2	2235	5	537	1	1698	4	7441
stxhost3							
Backup progress: <div><div></div></div>							24 %
Hide Output	Show Label	Print/ Send	Backup Currently Running				

The following is the [Backup Output Display](#) which is displayed when the **Show Output** button is pressed on the [Backup Status Report](#) screen above:



The desired job status for completed (or failed) jobs may be obtained in each of the following ways:

## View by Server

Select **View→Backup Status/Output→By Server** from the menu bar. A list of servers is displayed as with the same screen which appears when selecting to [View Backup Labels by Server](#).

Select the server from the list by clicking on the button to the left. Once you do so, a list of backups performed to the selected server is displayed, as in the example [View Backup labels by Server](#).

Note that the color of the button represents whether the backup was successful (green) or failed (red). The Job ID, date and time, and a list of clients on the media are displayed for each label in the list. To display the [Backup Status Report](#), select a specific **run date** from the list. If you want to return to the server list to select a different server, press the **Go Back**. Otherwise press the **cancel button** to close this window.

To show the [Backup Output Display](#), select the **Show Output** button on the status report screen.

## View by Job ID

Select **View→Job Status/Output→By Job ID** from the main menu bar if you want to select the backup status to display from a list of Job Ids. After selecting this option, a list of configured Jobs and corresponding job information is displayed similar to the screen shown when you select to [View Backup Labels by Job ID](#).

Select the desired job. An additional list will display, showing the dates the job has been run, as seen in the display [View Backup Labels by Job ID](#).

Note that the color of the button represents whether the backup was successful (green) or failed (red). The Job ID, date and time, and a list of clients on the media are displayed for each label in the list. To display

the [Backup Status Report](#), select a specific **run date** from the list. If you want to return to the job display screen to select a different job, press the **Go Back** button. Otherwise press the **cancel button** to close this window.

To show the [Backup Output Display](#), select the **Show Output** button on the status report screen.

## View by Client

Select [View→Job Status/Output→By Client](#) from the main menu bar if you want to select the job to display from a list of backups performed by client. After selecting this option, a list of clients and each backup type that the client has performed is displayed similar to the example when you select to [View Backup labels by Client](#).

Select the button next to the client and backup type you wish to display. An additional list of specific backup dates for the selected client and backup data will be shown, as seen in [View Backup Labels by Client](#).

Note that the color of the button represents whether the backup was successful (**green**) or failed (**red**). The Job ID, date and time, and a list of clients on the media are displayed for each label in the list. To display the [Backup Status Report](#), select a specific **run date** from the list.

Note that the display will include all client backups in the job, not just the selected client. The selected client button on the status screen will be automatically selected, however, so you can show the [Backup Output Display](#) for the client by pressing the **Show Output** button.

If you want to return to the client list to select a different client, press the **Go Back**. Otherwise press the **cancel button** to close this window.

# 17. Verify a Backup

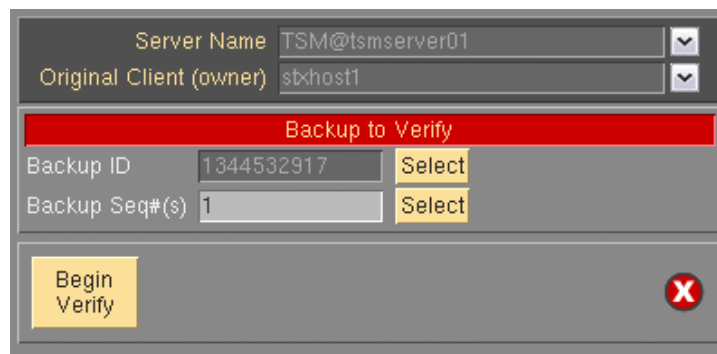
After a backup job has complete, it is often a good precaution to verify the backup to ensure the data on the backup media is complete and readable. The verify process reads all of the data on the backups and verifies it is in the correct format. The backup job may have included multiple clients.

If you selected to automatically [Verify Backups When Complete](#) within the [Backup Job configuration](#), then the backup data was verified at that time, and it is generally not necessary to verify again. However, if you do not auto-verify as part of the backup process, you may do so at a later time by following the steps in this section.

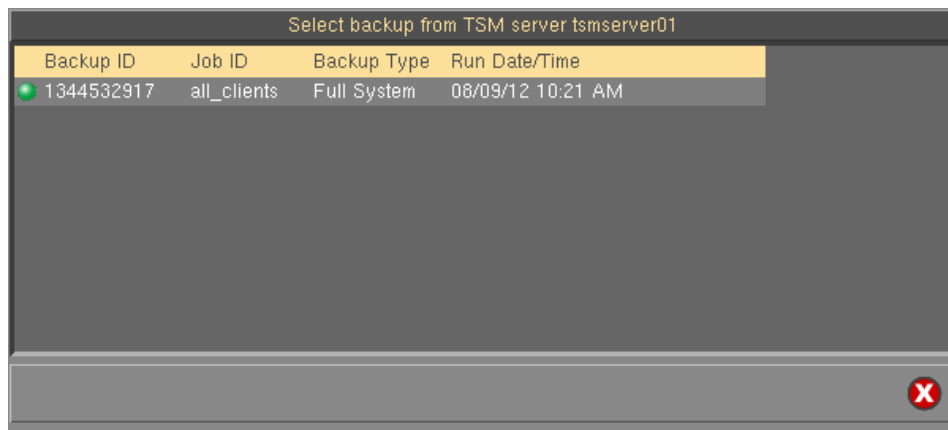
## Selecting The Data to Verify

To verify a backup job, perform the following steps:

1. Select [Actions→Verify Backup Jobs](#) from the menu bar. A window similar to the following will appear:



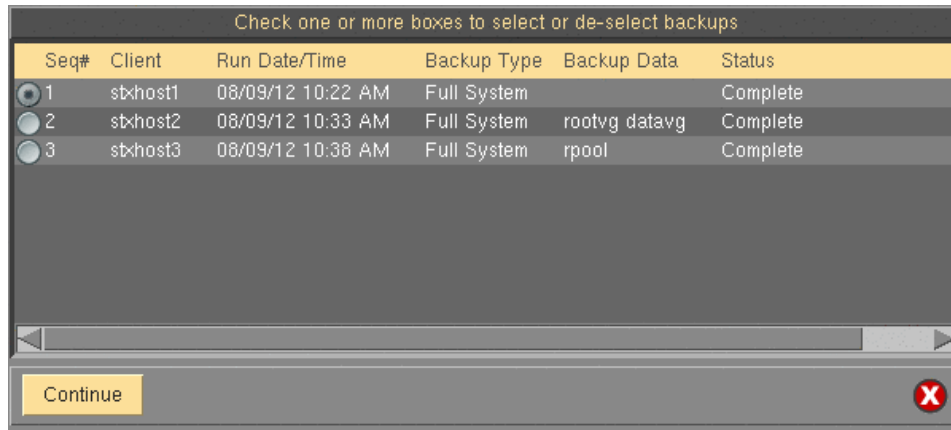
2. Use the arrow button to select a **Server name**. If you want to verify a backup performed to a client's local tape drive, select the "**local (client tape)**" option at the top of the list. In this case, the **Original Client (owner)** field will change to **Client Name**, and a new field, **Device Name** will appear.
3. If you selected a *TSM Server*, use the arrow button to select the **Original Client (owner)**. All backups are stored on the server in a *TSM filespace* specific to each client, so you must therefore know the original client (node) the backup was created for. In this case, any client that was part of the backup job to be verified will be sufficient, since we need to list the Backup IDs which that client is part of.
4. If you selected **local (client tape)** in the **Server name** field, you must select the **Client Name** and the **Device Name (SBTAPE)** from which to read the backup in the fields provided.
5. Press the **Select** button next to the **Backup ID** field. You will be provided a list of backup jobs on the server in which the client is included, similar to the following example:



Select the specific backup job to verify by clicking on the button to the left of the desired job.

- Next, if there are multiple backups (clients) in the job, another screen will appear with a list of backups to select from. The information about the backup will be preceded by the **backup sequence number**, starting with 1 and ending with the last backup (client) on the media.

The following is a sample of this screen:



You may select any one or more backups to verify by clicking on the button to the left of the desired selection and a checkmark will appear in the button. If you wish to de-select an option, simply click the button again and the checkmark will disappear. When all selections have been made, click the **Continue** button at the bottom of the screen.

The selected **Backup ID** and **Backup Seq#(s)** will appear on the **Verify Data from a Backup** screen. From this screen, press the **Begin Verify** button to start reading the backups.

## Displaying the Status and Output of the Verify

After performing the steps above, the verify will begin and the verify status report screen, as shown below, will appear automatically. Listed on the screen will be a status line for each of the backup(s) previously selected. Information pertaining to the progress and performance of the verify will be updated for each line as the corresponding backup is being read.

Backup ID: 1344532917							
Server: TSM@tsmserver01 Device: API							
Seq#/Client	Estimated		Actual		Remaining		Performance
	Megabytes	Minutes	Megabytes	Minutes	Megabytes	Minutes	Kbytes/Sec.
1: stxhost1	2672	4	1576	2	1096	2	10760
2: stxhost2							
3: stxhost3							

58 % Complete

Show Output Backup Info Print/Send Cancel Verify Verify Currently Running X

Note that this screen may not be closed as long as the verify is running. It will remain on the screen after the verify completes until it is closed by the user. Once the screen is closed, the verify status and output messages may not be redisplayed.

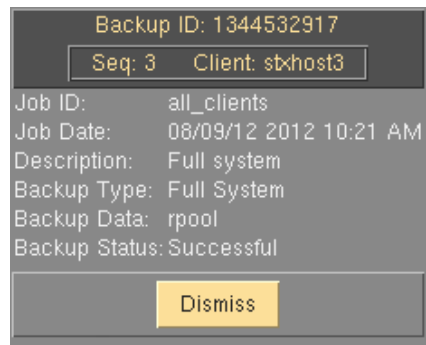
To view the output of the verification of a particular backup, first select the **Client** button, then press the **Show Output** button at the bottom of the screen. An output screen similar to the following will then appear, showing the status of the verify:

Backup ID: 1344532917	
Seq: 1 Client: stxhost1	
Press a client button in the STATUS REPORT window to show output for a different client.	
Output Messages	
-rw-r--r--	root/root 528 2012-08-09 10:22 ./storix/config/tsm/dsm.sys
drw-----	root/root 0 2012-08-09 08:59 ./storix/config/tsm/EN_US/
lrwxrwxrwx	root/root 0 2012-08-09 08:59 ./storix/config/tsm/EN_US/dsmclientV3.cat ->
./storix/config/tsm/EN_US/dsmclientV3.cat	->
-rw-r--r--	root/root 22 2012-08-09 10:18 ./storix/config/group
-rw-r--r--	root/root 1867 2012-08-09 08:59 ./storix/config/sthttpd.conf
-rw-----	root/root 13 2012-08-09 08:59 ./storix/config/library_cmds
-rwx-----	root/root 17 2012-08-09 08:59 ./storix/config/license
drwx-----	root/root 0 2012-08-09 08:59 ./storix/custom/
-rw-r--r--	root/root 2921 2012-08-09 08:59 ./storix/custom/prepost.sample
-rw-r--r--	root/root 1203 2012-08-09 08:59 ./storix/custom/prepostsnap.sample
drwxrwxrwt	root/root 0 2012-08-09 10:22 ./storix/temp/
Warning, Error & Status Messages	
Verifying backup of filesystem / ...	
The verify completed on Thu Aug 09 11:09.	

A complete list of files on the backup will be displayed as each file is read. This screen may be closed and redisplayed at any time, even after the verify completes, as long as the [Verify Status Report](#) screen has not been closed.

In addition to the job output, summary information for the selected backup may be displayed by selecting the **Client** button, then pressing the **Backup Info** button. A screen similar to the following example will appear:





Simply press the **Dismiss** button to close this window.

# 18. Recreate Volume Groups, Logical Volumes or Filesystems



The options described in this chapter are supported for **AIX** systems only. Due to the complexity of **Linux** and **Solaris** configurations, allowing creation of devices onto other devices (i.e. meta-disks on logical volumes or ZFS volumes on slices, etc), this features is not available for Linux or Solaris at this time.

## When to Use These Options

Due to various system problems, it may be necessary to recreate a filesystem or even an entire volume group that had to be removed from the system due to a failed disk drive or other problem. Since changes frequently occur to the system configuration, such as the expansion of filesystems, and moving or striping of logical volumes across disks, it is often not known the proper sizes and locations of the logical volumes and filesystems needed to restore the data properly. However, this information is stored on the backup media and can provide an automated way of recreating the volume groups, logical volumes and filesystems exactly as they were previously without prior knowledge.

Use one of these options to recreate the volume groups, logical volumes and/or filesystems into which you will later restore the data using the option [Restore Data from a Backup](#).

It is sometimes also desirable to replicate a volume group configuration from one system onto another. This option will allow you to use the information stored on a backup to create or recreate volume groups, filesystems or logical volumes on another system, while changing the locations and sizes of the filesystems and logical volumes to accommodate the new system.

In addition, a volume group or logical volume may be recreated on the same system from which it originated, even if the original volume group or logical volume still exists. This is handy for being able to restore prior data to the system and still keep the current copy available. This is accomplished by assigning a different volume group or logical volume name(s) to the new volume group or logical volumes created.



**Important:** This is the only option in the **SBAdmin Interface** that must run a user interface on the client (although the client system need not have a graphical display). In order to have the user interface (which is running on the client) display on the **admin system**, the client must have AIXwindows installed. If AIXwindows cannot be found on the client, an appropriate message will be displayed and you may not continue. You must either install AIXwindows on the client or rebuild the volume groups, logical volumes or filesystems manually on the client.

## Recreate Volume Groups

To recreate volume groups, you must have an accessible a **System Backup** containing the desired volume groups you wish to create.

To recreate a volume group, perform the following steps:

1. Select **Actions** → **Recreate Volume Groups** from the menu bar. A screen similar to the following will display:

Server Name: TSM@tsmsserver01

Original Client (owner): stxhost2

**Backup to Read**

Backup ID: 1344532917 Select

Backup Seq#: 2 Select

**Remake Options**

Client on Which to Create: stxhost2

Volume Group(s) to Create: datavg

Begin Remake X

2. Use the arrow button to select a **Server name**. If you want to use a backup performed to a client's local tape drive, select the "**local (client tape)**" option at the top of the list. In this case, the **Original Client (owner)** field will change to **Client Name**, and a new field, **Device Name** will appear.
3. If you selected a *TSM Server*, use the arrow button to select the **Original Client (owner)**. All backups are stored on the server in a *TSM filespace* specific to each client, so you must know the original client (node) the backup was created for.
4. If you selected **local (client tape)** in the **Server name** field, you must select the **Client Name** and the **Device Name (SBTAPE)** from which to read the backup in the fields provided.
5. Press the **Select** button next to the **Backup ID** field. You will be provided a list of backup jobs on the server in which the client is included, similar to the following example:

Select backup from TSM server tsmsserver01

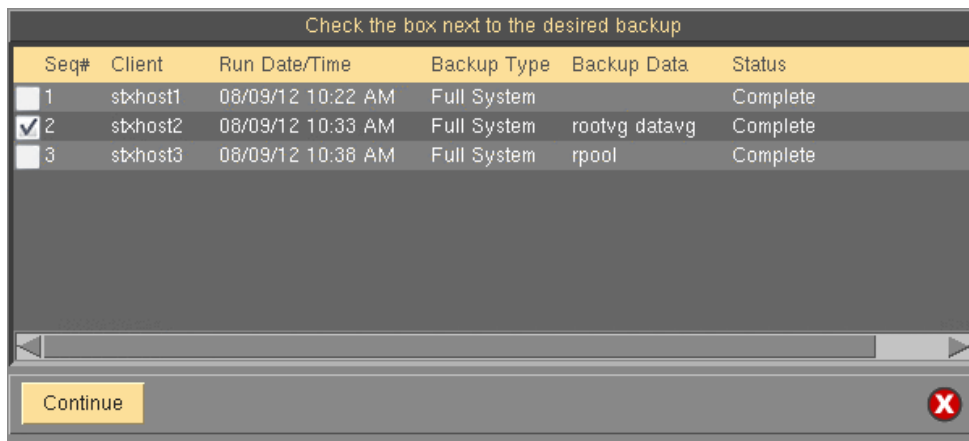
Backup ID	Job ID	Backup Type	Run Date/Time
1344532917	all_clients	Full System	08/09/12 10:21 AM
1344530436	stxhost2_level0	Full System	08/09/12 09:40 AM

X

Select the specific backup job to read by clicking on the button to the left of the desired job.

6. Next, if there are multiple backup on the media, another screen will appear with a list of backups to select from. This list will contain all of the backups within the selected job. The information about the backup will be preceded by the **backup sequence number**, starting with 1 and ending with the last backup (client) on the media.

The following is a sample of this screen:



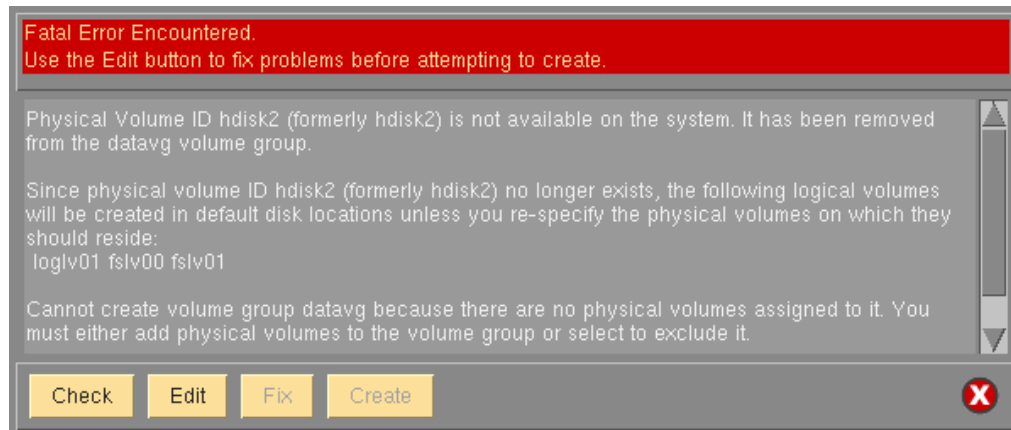
You may select the backup from which to recreate the VG by clicking on the button to the left of the desired selection and a checkmark will appear in the button. Only one selection may be made. If you select a different option, the checkmark will be removed from the previous selection. After making your selection, click the **Continue** button at the bottom of the screen.

6. You will be returned to the previous window, where you must select each of the following:

**Client on which to create** - This field will show the original client from which the backup was made. The backup information may be used to create the volume group(s) on a different client by selecting the arrow button to the right of this field and selecting a different client from the list.

**Volume Group(s) to create** - To list and select the volume group(s) that are defined on the backup and select one or more to create from the list, select the arrow next to this field. You must select at least one volume group to continue.

7. When all selections have been made, press the **Begin Remake** button at the bottom of the screen. A new screen similar to the following will appear and the LVM data on the media will be retrieved and checked for consistency with the current system configuration:

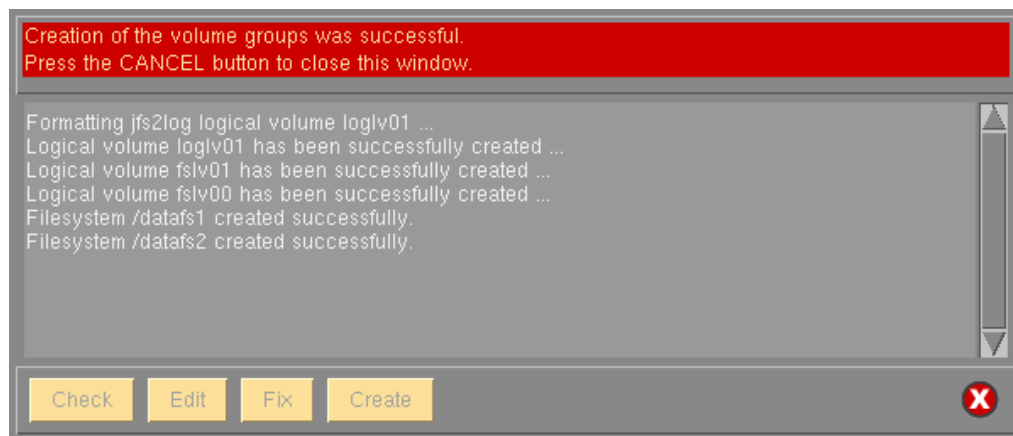


If there are changes required to make the selected volume group fit onto the current system, the **Edit** and **Fix** buttons will become available. If there are no problems found, the **Create** button will be available.

- a. The **Check** button may be used to check the LVM information again. This is automatically performed when you initially display this screen and any time you change the volume group, logical volume or filesystem information.
- b. The **Edit** button may be used to change any of the volume group, logical volume or filesystem information defined on the backup in order to make the volume group conform to the current

system configuration. This may include changing the volume group or logical volume names, selecting different disks on which to build the volume group, etc. This editing process is identical to that which is available during a system installation, and is described in detail in the section ***Change the Volume Group, Logical Volume and Filesystem Information*** in the ***SBAAdmin AIX System Recovery Guide***. After following the instructions in that section, press the **ESC (escape) key** on that screen to exit and save changes.

- c. The **Fix** button may be used if there were non-fatal errors that can be automatically repaired. For instance, if there is only one physical volume available, and a logical volume is striped, the striping would need to be turned off to create the logical volume as this required at least two physical volumes. The errors described in the messages section of the window indicate if and what changes would automatically be made if the **Fix** button is selected.
- d. The **Create** button will become available only after all errors, both fatal and non-fatal, have been fixed (either using the Fix button or by editing the volume group, logical volume or filesystem information using the Edit button). When you select this button, the volume group and all of its logical volumes and filesystems will be created as defined and the messages will be updated to reflect the progress and completion of the process as follows:

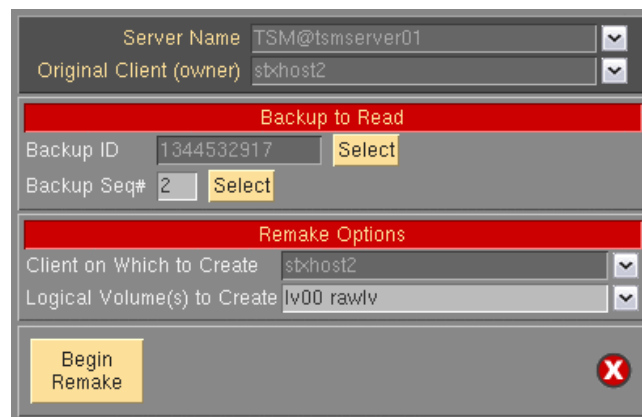


## Recreate Logical Volumes or Filesystems

To recreate logical volumes or filesystems, you must have accessible a [System](#), [Volume Group](#), [Logical Volume](#) or [Filesystem Backup](#) containing the desired logical volumes or filesystems you wish to create.

To recreate a logical volume or filesystem, perform the following steps:

1. Select **Actions→Recreate Logical Volumes or Filesystems** from the menu bar. A screen similar to the following will display:



2. Use the arrow button to select a **Server name**. If you want to use a backup performed to a client's local tape drive, select the "**local (client tape)**" option at the top of the list. In this case, the **Original Client (owner)** field will change to **Client Name**, and a new field, **Device Name** will appear.
3. If you selected a *TSM Server*, use the arrow button to select the **Original Client (owner)**. All backups are stored on the server in a *TSM filespace* specific to each client, so you must know the original client (node) the backup was created for. In this case, any client that was part of the backup job to be verified will be sufficient, since we need to list the Backup IDs which that client is part of.
4. If you selected **local (client tape)** in the **Server name** field, you must select the **Client Name** and the **Device Name (BTAPE)** from which to read the backup in the fields provided.
5. Press the **Select** button next to the **Backup ID** field. You will be provided a list of backup jobs on the server in which the client is included, similar to the following example:

Select backup from TSM server tsmserver01

Backup ID	Job ID	Backup Type	Run Date/Time
<input type="radio"/> 1344532917	all_clients	Full System	08/09/12 10:21 AM
<input type="radio"/> 1344530436	stxhost2_level0	Full System	08/09/12 09:40 AM

Select the specific backup job to read by clicking on the button to the left of the desired job.

6. Next, if there are multiple backup on the media, another screen will appear with a list of backups to select from. For TSM backups, this list will contain all of the backups within the selected job. For tape backups, there may be multiple jobs on the media. In this case, the list will contain all of the backups, even those from different jobs. The information about the backup will be preceded by the **backup sequence number**, starting with 1 and ending with the last backup on the media.

The following is a sample of this screen:

Check the box next to the desired backup

Seq#	Client	Run Date/Time	Backup Type	Backup Data	Status
<input type="checkbox"/> 1	stxhost1	08/09/12 10:22 AM	Full System		Complete
<input checked="" type="checkbox"/> 2	stxhost2	08/09/12 10:33 AM	Full System	rootvg datavg	Complete
<input type="checkbox"/> 3	stxhost3	08/09/12 10:38 AM	Full System	rpool	Complete

Continue

You may select the backup from which to recreate the LV or filesystem by clicking on the button to the left of the desired selection and a checkmark will appear in the button. Only one selection may be

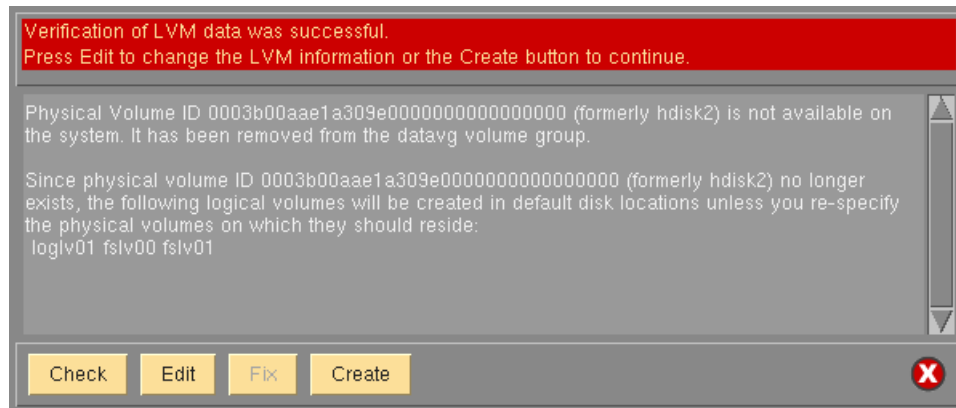
made. If you select a different option, the checkmark will be removed from the previous selection. After making your selection, click the **Continue** button at the bottom of the screen.

7. You will be returned to the previous window, where you must select each of the following:

**Client on which to create** - This field will show the original client from which the backup was made. The backup information may be used to create the logical volumes and filesystems on a different client by selecting the arrow button to the right of this field and selecting a different client from the list.

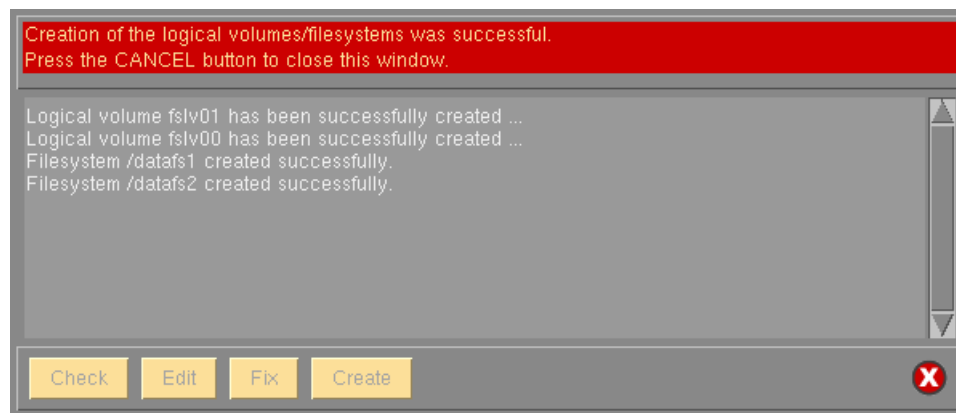
**Logical Volume(s) to create** - To list and select the logical volume(s) (and filesystems) that are defined on the backup and select one or more to create from the list, select the arrow next to this field. You must select at least one logical volume to continue.

8. When all selections have been made, press the **Continue** button at the bottom of the screen. A new screen similar to the following will appear and the LVM data on the media will be retrieved and checked for consistency with the current system configuration:



If there are changes required to make the selected volume group fit onto the current system, the **Edit** and **Fix** buttons will become available. If there are no problems found, the **Create** button will be available.

- a. The **Check** button may be used to check the LVM information again. This is automatically performed when you initially display this screen and any time you change the volume group, logical volume or filesystem information.
- b. The **Edit** button may be used to change any of the volume group, logical volume or filesystem information defined on the backup in order to make the volume group conform to the current system configuration. This may include changing the volume group or logical volume names, selecting different disks on which to build the volume group, etc. This editing process is identical to that which is available during a system installation, and is described in detail in the section **Change the Volume Group, Logical Volume and Filesystem Information** in the **SBAAdmin AIX System Recovery Guide**. After following the instructions in that section, press the **ESC (escape)** key on that screen to exit and save changes.
- c. The **Fix** button may be used if there were non-fatal errors that can be automatically repaired. For instance, if there is only one physical volume available, and a logical volume is striped, the striping would need to be turned off to create the logical volume as this required at least two physical volumes. The errors described in the messages section of the window indicate if and what changes would automatically be made if the **Fix** button is selected.
- d. The **Create** button will become available only after all errors, both fatal and non-fatal, have been fixed (either using the Fix button or by editing the volume group, logical volume or filesystem information using the Edit button). When you select this button, the volume group and all of its logical volumes and filesystems will be created as defined and the messages will be updated to reflect the progress and completion of the process as follows:





# 19. Restore Data from a Backup

Data may be restored from a TSM server to any client using the [SBAdmin Interface](#). A backup taken from one client may also be restored to another client, unless, for security reasons, you chose (in the backup profile) not to allow only the **Original Client (owner)** to read the backup in the **TSM Backup Read Permission** field.

Any type of data contained on a backup may be restored. A [System Backup](#), for instance, may contain multiple *volume groups*, each of which may contain *raw logical volumes* and *filesystems*, each of which may contain various *directories*, which each contain multiple *files*. It is therefore possible to restore one or more files, directories, logical volumes, filesystems, volume groups, or the entire system from a System Backup!



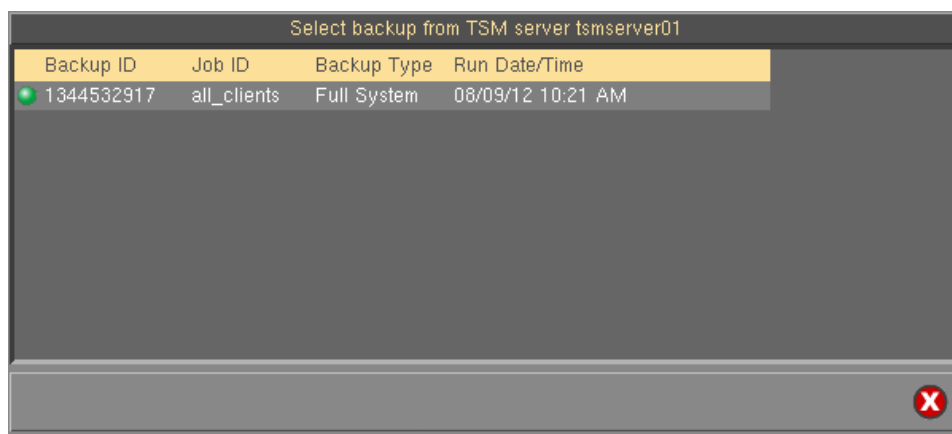
Restoring data from a System Backup is not the same as *reinstalling* a client from a System Backup. This is a different process which is described in detail in the section *Installing from a System Backup* in the **SBAdmin System Recovery Guide**.

## Selecting the Backup to Restore From

To restore data from a backup, perform the following steps:

1. Select **Actions** → **Restore Data from a Backup** from the menu bar. A window similar to the following will appear:

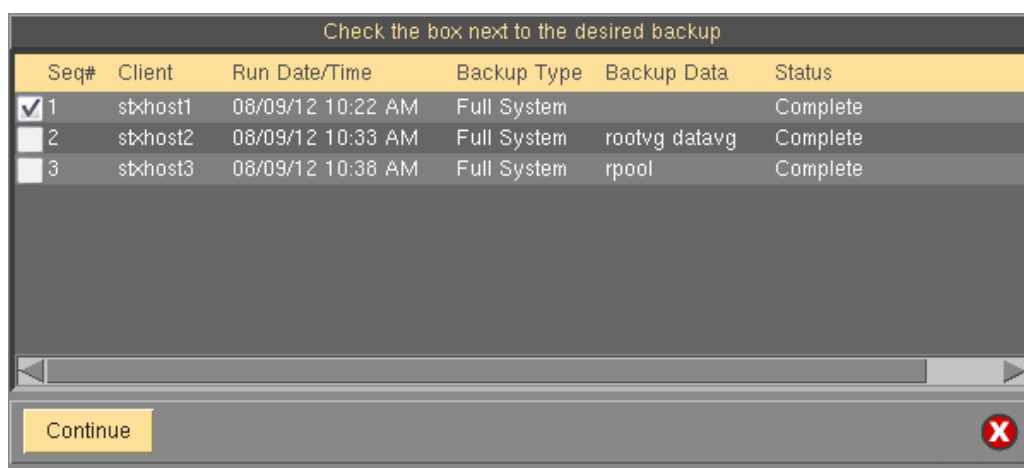
2. Use the arrow button to select a **Server name**. If you want to restore from a backup performed to a client's local tape drive, select the "**local (client tape)**" option at the top of the list. In this case, the **Original Client (owner)** field will change to **Client Name**, and a new field, **Device Name** will appear.
3. If you selected a *TSM Server*, use the arrow button to select the **Original Client (owner)**. All backups are stored on the server in a *TSM filespace* specific to each client, so you must know the original client (node) the backup was created for. In this case, any client that was part of the backup job to be verified will be sufficient, since we need to list the Backup IDs which that client is part of.
4. If you selected **local (client tape)** in the **Server name** field, you must select the **Client Name** and the **Device Name (SBTAPE)** from which to read the backup in the fields provided.
5. Press the **Select** button next to the **Backup ID** field. You will be provided a list of backup jobs on the server in which the client is included, similar to the following example:



Select the specific backup job to restore from by clicking on the button to the left of the desired job.

- Next, if there are multiple backup on the media, another screen will appear with a list of backups to select from. For TSM backups, this list will contain all of the backups within the selected job. The information about the backup will be preceded by the **backup sequence number**, starting with 1 and ending with the last backup on the media.

The following is a sample of this screen:



- You may select any one or more backups to verify by clicking on the button to the left of the desired selection and a checkmark will appear in the button. If you wish to de-select an option, simply click the button again and the checkmark will disappear. When all selections have been made, click the **Continue** button at the bottom of the screen

The **Backup ID** and **Backup Seq#** selected will be displayed in the fields in the previous window...

## Selecting Restore Options

After selecting the backup media to restore from, you will be returned to the previous window, where you may enter or select the following restore options:

- Client to restore data to:** The client from which the backup originated will be displayed. If you wish to restore the data to a different client, press the arrow button to the right of the client name to display a list of clients and select from the list. If the [backup profile](#) did not allow a different client to read the data, the client may not be changed.

2. **Type of data to restore:** By default, the type of data to restore will be **Volume Groups/ZFS Pools**. However, it is possible to restore different types of data, including **logical volumes**, **filesystems**, **directories** or **regular files**. To restore a different type of data than that shown, select the arrow button to display a list of restore data types allowed for this type of backup and select from the list.
3. **[Data] to restore:** This label will indicate the **restore data type** selected in the previous field. You may type one or more options to restore (i.e. a list of volume groups if restoring volume groups), each option separated by spaces. You may also click on the arrow button to display a list of options to restore. If restoring files or directories, this list could be quite long, and new buttons will appear at the bottom of the screen from which you may select items to restore from a file tree or search the list for specific patterns. Refer to [Selecting Data to Restore](#) below for details.
4. **Destination [option]:** This label will show either directory or logical volume, depending on the restore data type. If restoring a logical volume (i.e. one not containing a filesystem), you may type the name of a different logical volume (which must already exist) to restore the data to. If restoring from any other backup type, you may select the directory into which the data will be restored. For more details on how the files will be restored to the new destination, refer to [Restoring Data to a New Destination](#) below.

When all desired selections have been made, press the **Begin Restore** button at the bottom of the screen to start the restore.

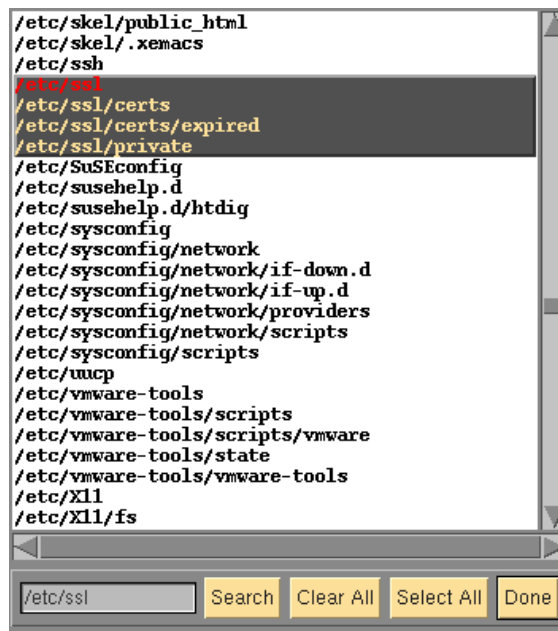
## Selecting Data to Restore

There are different ways of selecting the data to restore from the [Restore Options Screen](#), depending on the type of data being restored:

1. If you have selected to restore *Volume Groups*, *ZFS Pools*, *Filesystems*, *Logical Volumes*, *Meta-disks* (Linux/Solaris), *Partitions* (Linux), *Slices* (Solaris), then an arrow button will appear to the right of the **[Data] to Restore** field. By pressing this button, the list of data items of the selected type will be read from the backup, and you can select one or more items from the list.
2. If you have selected to restore either *Directories* or *Regular Files*, the arrow button next to the **[Data] to Restore** field will disappear, and new buttons will appear at the bottom of the screen instead, labeled **Search/Select by Name** and **Select Using File Tree**. Those options are explained in the next sections below.
3. Lastly, you may simply enter the data to restore in the field. You can enter one or more items, separated by spaces. If an item, such as a filename, contains spaces, you must enter that filename surrounded by quotes to preserve the space in the filename. Note that you can use wildcards (\*) to restore multiple files with similar names or locations. Refer to [Restoring Files Using Wildcards](#) below.

### Search/Select by Name

When restoring directories and regular files, you may press this button to view a complete list of files, select one or more files or directories from the list, select a group of files or directories, or search the list using a string or characters or wildcards (\*). When pressing this button, a screen similar to the following will appear:

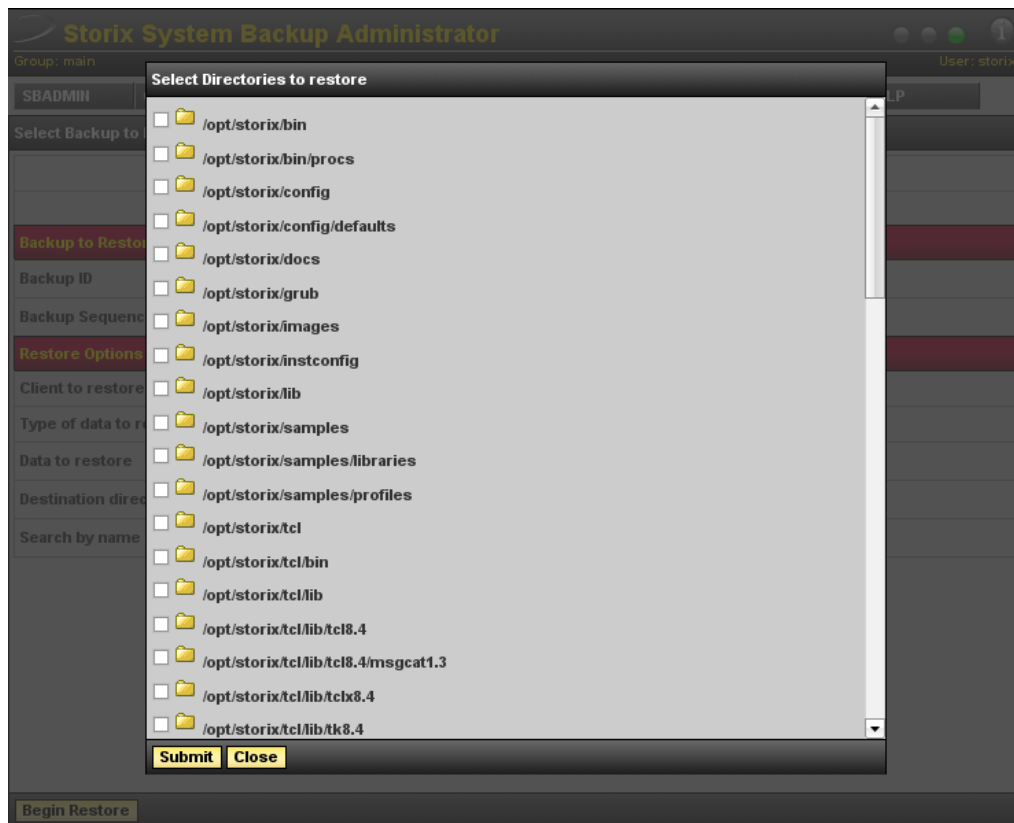


From this window, you may:

1. Click a specific entry to highlight and select that entry to restore.
2. Click and drag the mouse over a number of entries to highlight and select all those entries.
3. Click any highlighted entry to de-select that item to restore.
4. Enter a search pattern in the box at the lower-left corner of the window and press the **Search** button to find the next occurrence of that pattern. The next entry found that matches the search pattern will be **highlighted in red**. A search pattern can be any character string which may also include wildcard characters, or **asterisks (\*)**. An asterisk in a search pattern may match any number of other characters in the list item.
5. Press the **Clear All** button to de-select any highlighted entries.
6. Press the **Select All** button to select "all" entries and return to the previous screen.
7. When all specific entries have been selected, press the **Done** button. You will be returned to the [Restore Options Screen](#), and the selected list of files will appear in the **[Data] to Restore** field.

When using the web interface it is recommended to use a wild card to limit the **Search/Select by Name** button. Due to limitations with javascript and the web browser, SBAdmin will by default only display up to 1000 files in the search result.

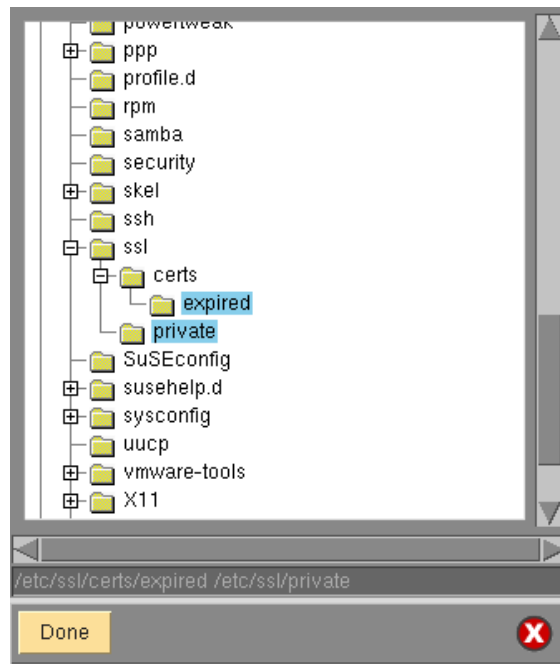
Restore Options	
Client to restore data to	woody
Type of data to restore	Directories
Data to restore	all
Destination directory	same
Search by name	/opt/storix/* <b>Search</b>



From this popup window you may select one or more files to restore. After selecting the **Submit** button you will be returned to the main screen and can begin the restore.

## Select Using File Tree

Also, when selecting to restore regular files or directories, you can press this button to view a drop-down file-tree list of files or directories, and select from the list. When pressing this button, the backup media will be read, and a list of directories will appear, which may or may not contain the regular files, depending on which you selected to restore (viewing only directories will save much time and memory).



From this window, you may:

1. Click on any folder or file icon to select that directory or file. Note that when selecting a directory, all files and directories beneath become un-selected as they will be restored automatically as part of their parent directory. Click a selected folder or file to de-select. Note that the full path of selected files or directories will appear in the box below the file tree.
2. Click the plus-sign (+) next to a directory to open the directory and view and select from the files or directories beneath. The plus (+) sign will turn to a minus (-) sign. Clicking the minus sign will close the directory, but any files or directories selected within will remain selected.
3. Double-click on a folder icon will open the folder just as pressing the plus (+) sign.
4. When you have selected all desired files and directories, press the **Done** button at the bottom of the screen. You will be returned to the [Restore Options Screen](#), and the selected list of files will appear in the **[Data] to Restore** field.

## Restoring Files or Directories Using Wildcards

There may be many files on a backup containing similar name that you want to restore without having to select each and every file, which may exist in different directories. To do so, you may use **wildcards** in the filenames. A wildcard is denoted by an **asterisk (\*)** in one or more parts of the name. For example:

```
/home/*/*.gif
```

will result in all files in a sub-directory of the **/home** filesystem containing **“.gif”** at the end of the name. This would result in files such as:

```
/home/anthony/mom.gif
/home/michelle/candy.gif
```

but will NOT result in files such as:

```
/home/picture.gif
/home/anthony/myfiles/picture.gif
```

because these files are not in a single sub-directory of **/home** as indicated by the wildcard filename (**/home/\*/\*.gif**). To restore these files you would need to also include **/home/\*.gif** and **/home/\*/\*/\*.gif** in the list of files to restore.

To understand the use of wildcards in the restore, you need only understand how to list files on the system. Any files that are listed on the system when you type:

```
ls /home/*/*.gif
```

would be restored when using this same notation in the list of files to restore.

## Restoring Data to a New Destination

When restoring files or directories from a *System Backup*, you may enter a new destination directory in the **Destination** field. When restoring a single logical volume, ZFS volume, partition, slice or meta-disk, you may enter a new device name into which to restore the data.

If restoring a *single filesystem*, or *specific files or directories* from a backup, and you want to restore to a different directory, the files will be restored *relative* to the original filesystem mount point. For example, if you are restoring data from the **/data1** filesystem into the **/data2** directory, the **/data1/info/stuff** file will be restored to **/data2/info/stuff**.

If restoring *multiple filesystems* from a backup, the files from each filesystem will be restored to different directories under the new destination directory. This is to protect against the same filename from different filesystems being restored to the same location. For example, when restoring the **/data1** and **/data2** filesystems to the **/datanew** directory, the files will be restored to **/datanew/data1** and **/datanew/data2** respectively.

When restoring a single logical volume, ZFS volume, partition, slice or meta-disk, the new device name must already exist, may not currently be in use by any process, and must have been created at least as large as the original device.

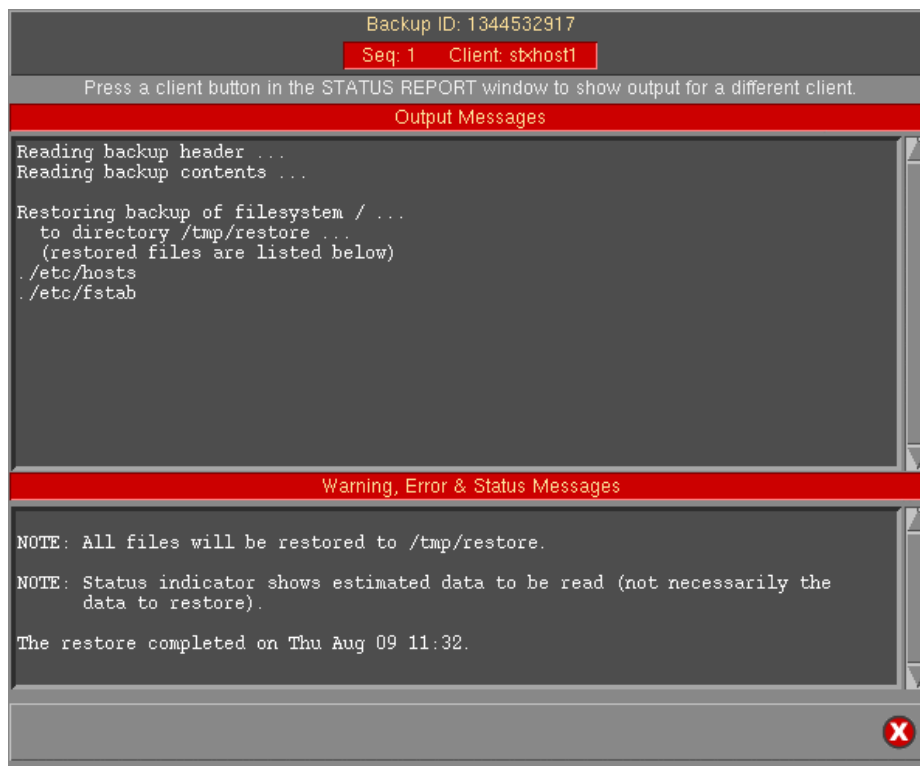
## Displaying the Status and Output of the Restore

After pressing the **Begin Restore** button at the bottom of the restore options screen the restore will begin. Immediately, the restore **Status Report Screen**, as shown below, will appear. Listed on the screen will be a status line for the backup previously selected. Information pertaining to the progress and performance of the restore will be updated as the data from the backup is read.

Backup ID: 1344532917							
Server: TSM@tsmserver01 Device: API							
Seq#/Client	Estimated		Actual		Remaining		Performance
	Megabytes	Minutes	Megabytes	Minutes	Megabytes	Minutes	Kbytes/Sec.
1: stxhost1	2672	3	552	0	2120	3	11546
20 % Complete							
<div><div></div></div>							
Show Output	Backup Info	Print/Send	Cancel Restore	Restore Currently Running			

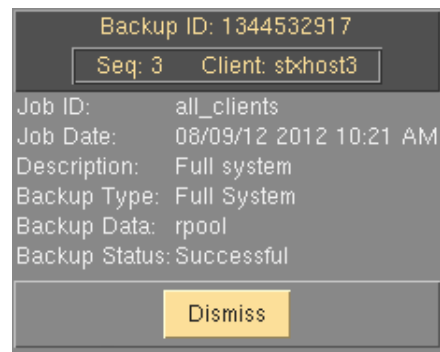
This screen may not be closed as long as the restore is running. It must remain on the screen after the restore completes, after which time it may be closed by pressing the [cancel button](#). Once the screen is closed, the restore status and output messages may not be redisplayed.

To view the output of the restore process, press the **Show Output** button at the bottom of the screen. An output screen similar to the following will then appear, showing the output and status messages of the restore:



If restoring filesystem data, the files will be listed on the screen as they are restored. This screen may be closed and redisplayed at any time, even after the restore completes, as long as the [Restore Status Report](#) screen has not been closed.

In addition to the restore output, summary information for the selected backup may be displayed by selecting the **Backup Info** button. A screen similar to the following example will appear.



Simply press the **Dismiss** button to close this window.



## 20. Preferences

In this section, options that affect the overall operation or appearance of the application are discussed. To change the user preferences, select **File→Preferences** on the menu bar.

### Software License

This option may be used to display a screen used to reconfigure your *Administrator license* or add or change *Optional Features*. To view or change the license information, select **File→Preferences→Software License** from the menu bar. A screen similar to the following will appear:

**Administrator License Type**

☐ Workstation Edition

☐ Network Edition

☒ TSM (Tivoli) Edition

**Optional Feature**

☐ Backup Encryption

**License Information**

☒ 30-day free evaluation

☐ Permanent license

License key:

Register to:

Save/Exit

When using the web interface:

Administrator License			
29 Days Remaining on trial			
License Type	30-day Trial	License Key	Registered To
<input checked="" type="radio"/> Network Edition and 100 clients	<input checked="" type="checkbox"/> Trial	<input type="text"/> - <input type="text"/> - <input type="text"/> - <input type="text"/> - <input type="text"/>	<input type="text"/>
<input type="radio"/> Workstation Edition			
<input type="radio"/> TSM Edition			
Optional Features			
Backup Encryption for 100 clients 30 Days Remaining on trial	<input checked="" type="checkbox"/> Trial	<input type="text"/> - <input type="text"/> - <input type="text"/> - <input type="text"/> - <input type="text"/>	<input type="text"/>
TSM Client Backup for 100 clients 30 Days Remaining on trial	<input checked="" type="checkbox"/> Trial	<input type="text"/> - <input type="text"/> - <input type="text"/> - <input type="text"/> - <input type="text"/>	<input type="text"/>

If you're reading this user guide, you probably installed a *TSM Edition* license, allowing for System Backups of TSM Clients (nodes) to one or more TSM Servers. It may be desirable to change the license for a number of reasons:

1. You have non-TSM clients or want to backup to a non-TSM server. This would require the *Network Edition* license. To enable all of the features of the *Network Edition* and keep all of the *TSM Edition* features also, you'll need both the *Network Edition* and the *TSM Client Backup* feature.
2. You installed an evaluation (trial) license of the *TSM Edition*, and upon expiration, want to now install a permanent (purchased) license key.

3. You purchased a *TSM Edition* for 10 clients (nodes), and now want to add support for another 6 clients.
4. You wish to install a new optional feature. For the *TSM Edition*, only the *Backup Encryption* optional feature is available.

## Administrator License

When the software is initially installed, you indicated the type of administrator you would be installing. This was either **Workstation**, **Network** or **TSM Edition**. You also entered a license key, which matched the administrator license type, and also indicated the number of clients supported by a Network or TSM Edition and the expiration time (if any) of the license. If using a Network or Workstation Edition license, this user guide will be replaced by the [System Backup Administrator User Guide](#).

## Backup Encryption Feature

**Backup Encryption:** The license key will indicate the number of clients that are to support backup data encryption. When installing this license, you will be able to apply data encryption to the number of clients the license supports.

When entering this function, your current *Administrator License* information is displayed. In the **License Type** section, you may select a different *Administrator License Type* (**Workstation**, **Network** or **TSM**), or you can select an *optional feature* (**Encryption**). When you select a different option in the **License Type** section, the current license information for that feature, if any, displayed.

Any *Administrator License* or optional feature may be installed for a one-time, 30-day trial period. After that, a permanent license key is required for the administrator and each optional feature.

After selecting either the *Administrator License* or the *Optional Feature*, you may add or change the license information. This includes changing from a trial to a permanent license (or vice-versa), entering a permanent license key, and the name of the person or company the product is registered to (also provided by **Storix** and must match the license key).

When you have completed all entries, press the **Save/Exit** button. The software will be reconfigured. In some cases, new options and features will automatically appear in the [SBAdmin Interface](#).

## General Preferences

By selecting [File→Preference→General Preferences](#), a screen similar to the following will be displayed, from which you may set or change numerous attributes defining the behavior of the SBAdmin application:

The screenshot shows the SBAAdmin GUI configuration window with the following sections:

- Interface Options:**
  - Operating systems supported by this Administrator: ☒ AIX ☒ Linux ☒ Solaris
  - Ring bell when important messages appear on the screen? ☒ Yes ☐ No
  - Fonts and Colors: [Configure](#)
  - Check for updates when starting interface? ☐ Yes ☒ No
- Report Options:**
  - Default Printer:  [Configure](#)
  - Email address when sending to "Email":
  - File to append when printing to "File":
- Network Options:**
  - IP address or hostname of the network interface to be used on this Administrator when communicating with backup servers and clients:
  - Number of seconds to wait for a network connection before timing out:
- General Backup Preferences:**
  - Backup process priority: Low  High (slider from 0 to 10)
  - Max concurrent backups to disk or TSM on each server:

At the bottom, there is a [Save](#) button and a red 'X' button.

The **Interface Options** define the features and appearance of the SBAAdmin GUI interface:

## Operating Systems Support

By default, when the [SBAAdmin](#) software is first installed, only support for the operating system running on the *Administrator* system is enabled. For instance, if the *Administrator* is running **AIX**, the only options that appear in the application will be applicable to **AIX** systems. However, if this **AIX** *Administrator* will be supporting **Linux** and/or **Solaris** clients, then you will want to add into the application those options that are applicable to Linux or Solaris systems also. You may later turn off support for client operating systems that will not be managed by the *Administrator*.

For example, only **Solaris** systems support ZFS. Therefore, by turning off Solaris support, no ZFS options (i.e. Zpool or ZFS Volume backups) will appear anywhere in the interface.

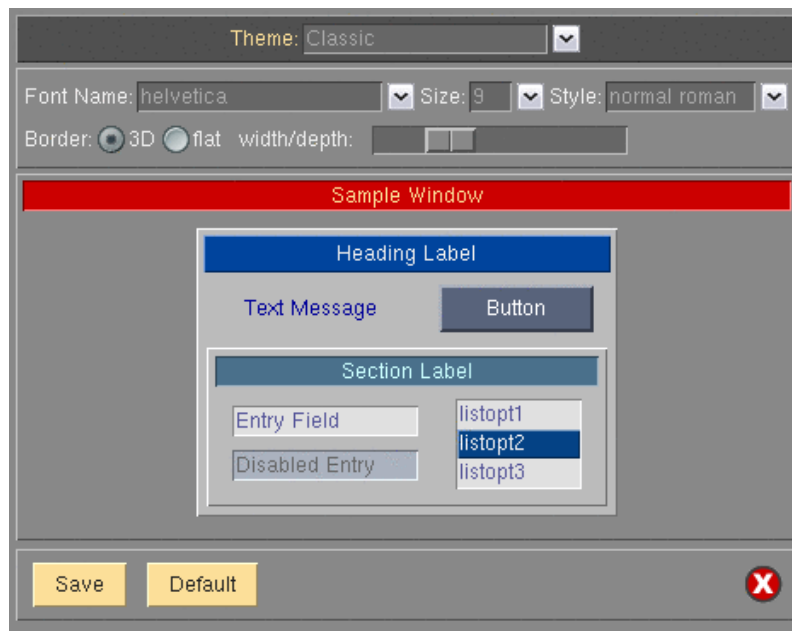
To enable or disable support for a particular operating system, simply select or de-select the button next to the corresponding operating system type. When finished, press the **Save** button.

## Sound On/Off

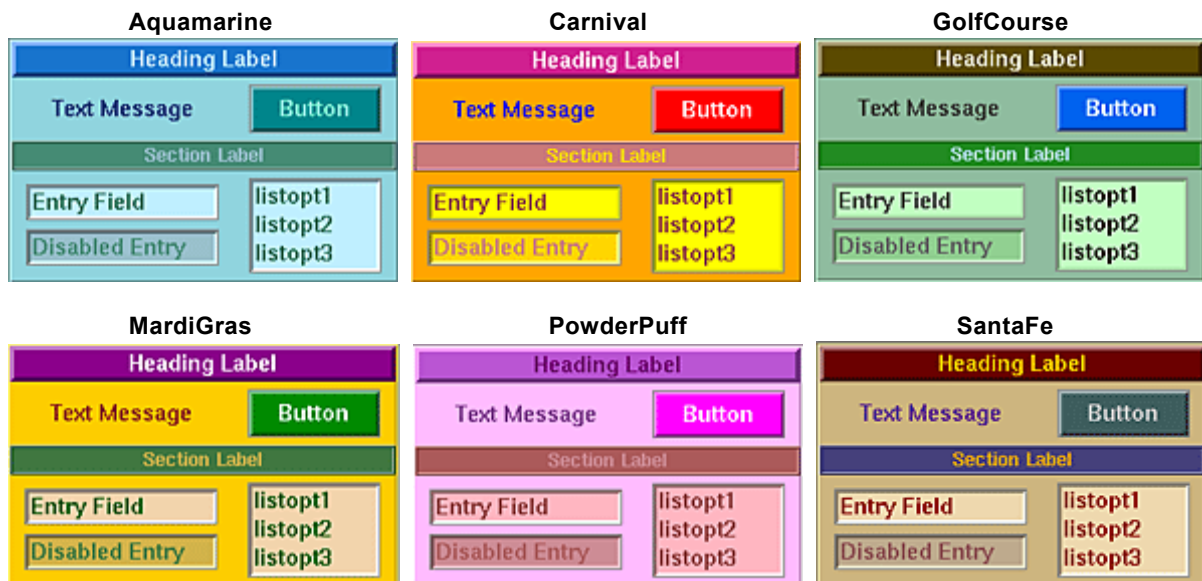
The option "Ring bell when important messages appear on the screen" allows you to select whether or not you wish to bear a "beep" whenever the Backup Administrator reports a message on the screen that requires attention. You may then select **Yes** or **No** indicating whether or not the bell should ring.

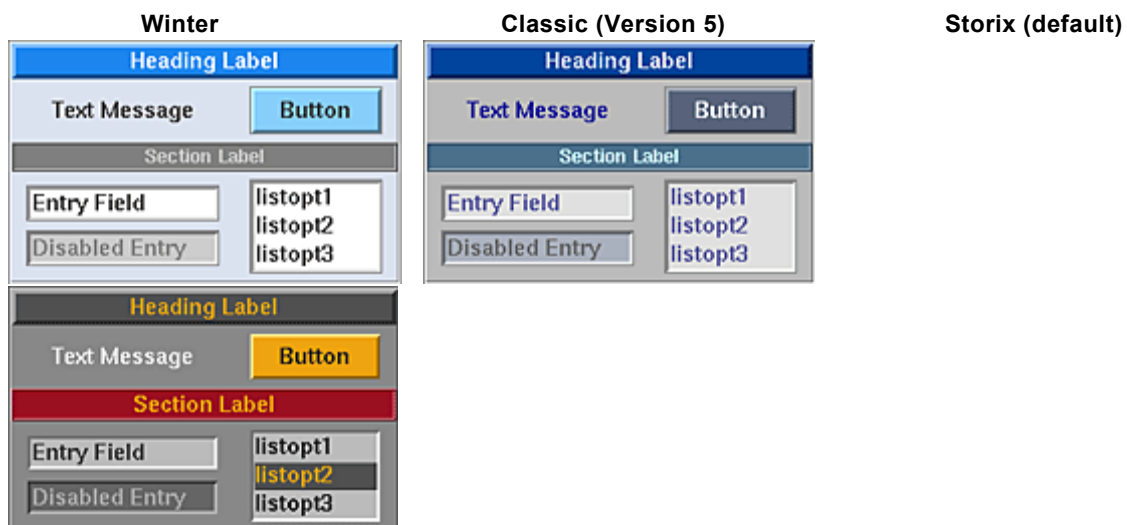
## Fonts & Colors

The font, font size, and colors used by the graphical user interface may be changed to suit your preferences. The selections made will apply to all screens within this application. Several color "themes" are available. To change these preferences, select [File→Preference→General Preferences](#), press the **Configure** Button next to **Fonts & Colors**. The following screen will appear:



This screen will always be displayed using the **Storix** color theme, even when another theme has been applied to other screens. To display a different color theme in the **Sample** section of the display, select one of the following from the **Theme** drop-down list:





To change the **Font Name**, **Size** or **Style**, click the arrow button next to the desired selection, then select an option from the list. The sample box will be changed to show your selections.

To change the **3D Effect** and the **Width/Size of Borders**, select the option or adjust the values to the desired settings. The sample box will be changed to show your selections.

Once you're satisfied with your selections, press the **Save** button to save the changes. If, after having previously saved difference sections, you want to return the screen to the default (*Classic*) font and colors, press the **Default** button or select *Classic* from the **Theme** drop-down, then **Save** the settings again.

As soon as you save your settings, a confirmation dialog box will appear, and when selecting to continue, all windows except the [Main Screen](#) will be closed. The Main Screen will then be updated to reflect your selection. All windows opened from this point will display the selected settings.

## Check for Updates

When launching the Administrator, the application will contact the Storix website in order to compare the currently running version of SBAdmin with the latest version available. If you are not running the most current version, a note will be displayed at the bottom of the interface. You may prevent this communication from occurring by selecting "No" to this option.

## Report Preferences

Reports and backup notifications can be printed, sent to an email address, or appended to a text file. This option is used to set up preferences for each.

To edit configure or change these options, select [File→Preference→General Preferences](#), and add or change the following options in the **Report Options** section.

### Default Printer (AIX)

It is assumed that AIX systems will always have AIX printer *queues* already setup. This option is used to select the default printer queue which will be automatically selected when using any of the **"Print/Send"** options within the application. The printer queue must already have been set up on the system. To select the default printer to use, select the printer queue from the pull down.

## Default Printer (*Linux/Solaris*)

Linux and Solaris systems provide a variety of ways to configure printers and supply numerous commands that may be used to submit files or jobs to the printers or queues. Therefore, this option will allow you to select a printer definition along with the command used to send data to the printer.



You should first configure your printer or printer queue using your Linux or Solaris system administration utilities. Be sure to test the command by typing it at the command line to send something to the printer before adding the command to the SBAAdmin Preferences.

To select the default printer used for reports and notifications, select from the pull down menu next to the **Default Printer** entry field, and select a pre-configured printer from the list. If you've not yet configured the printers within SBAAdmin, press **Configure** button, and a screen will appear like the example below:

A screenshot of a printer configuration dialog box. At the top, there is a label "Printer Name:" followed by a text box containing "printer" and a small downward arrow icon. Below this is a red header bar with the text "Printer Options". Under the header, there is a label "Command to print:" followed by a text box containing "lpr". Below that is a label "Set as default:" followed by two radio buttons, "Yes" (which is selected) and "No". At the bottom of the dialog, there are two buttons: "Save" and "Remove", and a red "X" icon in a circle on the right.

To define a new printer, enter the name of your printer in the box at the top of the screen. To change an existing printer definition, either type its name, or select it using the arrow button to the right of the entry field.

If configuring a new printer, the name you enter may be any name you choose, not necessarily the name of the printer queue as defined to Linux or Solaris. The name you choose will be presented when you select a printer from any of the other SBAAdmin printer list options.

In the **Command** box, enter the command used to submit a job to this printer. The name of the file (which is temporarily generated by SBAAdmin) will be added to the END of this command.

Press **Save** to add this printer to the list.

To remove a currently defined printer, select it in the listbox, then press the **Remove** button.

## Sending Reports to an Email Address

This option is used to designate the email address used when **Email** is chosen for the **Print/Send** options within the application. To set or change the email address, enter the email address into the text field labeled: **Email address when sending to "Email"**. After doing so, an **Email** option will appear when selecting to **Print/Send** any SBAAdmin report.

## Appending Reports to a File

This option is used to designate the path to the file that is appended to when **File** is chosen for the **Print/Send** options within the application. To change the file path, enter the full pathname of the file into the text field labeled: **File to append when printing to "File"**. After doing so, a **File** option will appear when selecting to **Print/Send** any SBAAdmin report. If the specified file does not exist when printing to the **File** option, the file will be automatically created. Any parent directories of the file must already exist.

## Network Options

### Network Interface

By default, the *admin system* will use the network adapter associated with the default *hostname* of the system when communicating with clients. If the system has multiple network adapters, you may choose a different network, which will only be used for communicating between this admin system and the clients. To do so, select [File→Preferences→General Preferences](#) from the menu bar, go to the **Network Options** section, and enter the IP address or hostname in the “**IP address or hostname of the network interface...**” field. If you want the system to go back to using the default adapter (according to the primary hostname of the system), simply remove the entry from this field.



The network adapter selected will be used to pass information between the admin system and clients, such as backup status messages, command output, and for polling the system availability. It is NOT used to pass the actual backup data, which is sent directly from the clients to the TSM servers.

**Important!** After setting this value, some or all of the clients servers may show as unavailable when the [Clients, Servers and Devices](#) are displayed on the Main Screen. If this should occur, it means that the client does not have the admin system defined using the alternate network adapter. To resolve this problem, edit the `/storix/config/system_admin_hosts` file on the client (where `/storix` is the data directory you chose when you installed the software), and either change the existing admin system hostname, or add the new admin system hostname on a line by itself.

### Network Timeout

For SBAdmin to perform any operations on a client, from querying it's availability to starting a backup job, it must execute a remote command. By default, if the admin system cannot contact the client within 10 seconds, it is assumed that the client is unavailable. This is adequate in most cases. However, if your network is slow to respond, perhaps due to slow hostname resolution, you may need to increase this value. To do so, select [File→Preferences→General Preferences](#) from the menu bar, then enter the new number of seconds in the in the field labeled “**Number of seconds to wait for a network connection before timing out**”.

When increasing the value, it will take longer to determine that a system is unavailable, so some processes used by the interface (most notably when displaying client, servers and devices from the [Main Screen](#)) may take longer to update if a client cannot be contacted. It is not advisable to increase this value to more than 30 seconds, depending on the total number of clients configured.



Changing this option will affect only the timeout value when the **Administrator** contacts the **clients**. It has no affect on the timeout TSM uses for the clients to contact the TSM server when running backups. To change the default timeout on the **client**, edit the `./stdefaults` file on the client and change the `SOCK_TIMEOUT` value to the desired number of seconds.

### Backup Process Priority

You can change the default CPU process priority of all backup jobs run from the admin system by selecting [File→Preferences→General Preferences](#), and moving the slider in the **Backup Process Priority** section to the desired number.

All backups will use the system default priority unless you set a different priority. The process is represented by the operating system using a scale of highest to lowest. You can view a process priority by typing “`ps -ef`” and referring to the NI column. For **Linux**, the number will be -19 (highest) to 20 (lowest), with a default of 0. For **AIX** and **Solaris**, the number will be from 0 (highest) to 39 (lowest), with a default of 20.

To make this simpler, SBAdmin represents this on a scale of 0 to 10, with 0 being lowest, 5 being normal (default), and 10 being highest. By default, this will be set to 5, indicating that the normal operating system default priority should be used.

It is common to lower this value if you do not want your backups to run as the same priority as other applications. This will usually cause the backup process to have less effect on the performance of other applications, but the backup could run a bit slower. You might consider setting this value to 3 to give backup processes a lower priority, but not so low that the backup takes too much longer.

If you want the backup process to run in the shortest possible time, with no regard to how it might adversely affect the performance of other applications, you can increase this value. Note that doing so will have little or no effect if there are no other applications or processes requiring CPU processing, but those that require the CPU could run slower. In this case, you might consider a setting of 7 to give priority to the backup without bringing all other applications to a halt.



Setting this option to any value other than 5 will apply to all backup jobs unless you change the [backup job process priority](#) within the job settings.

## Concurrent Backups

SBAdmin has no control over where the backup data is actually stored on the *TSM server*. Therefore, all backups to the TSM server may be run concurrently, even if they are writing to the same tape library or disk drives. This may pose a problem on the server for a number of reasons:

1. This may cause degraded I/O performance on the server, affecting other applications.
2. A single large backup to a server's disk could cause many smaller backups to take much longer since they must share the same I/O.
3. TSM may simultaneously write multiple backups to the same tape (interspersing the backup data), but all of the simultaneous backups will be limited by the speed of that single tape drive.

It would make more sense in any case to limit the number of concurrent backups to a manageable number. To limit the number of disk backups which may be written concurrently to the same server, select [File→Preferences→General Preferences](#), and enter a number in the **Limit concurrent backups to the TSM Server to:** field.

By leaving this field blank, there will be no limit to the number of concurrent backups.

## Auto-Terminate Stalled Backups

You may specify the number of minutes to wait before considering a backup as stalled and have the backup job automatically killed. This preference does not apply to backups written to tape devices because the timeout could be related to waiting for a new tape when reaching end of media. The default is to wait forever and not automatically kill the backup job.

A backup is considered to have stalled once all backup pre-processing has completed and backup data begins to write, but no progress has been made for the length of the defined timeout. If the timeout has been reached, notification will be sent based on your [notification settings](#), and a kill signal will be sent to the backup job.

To define stalled backups timeout select [File→Preferences→General Preferences](#) and enter the number of minutes in the **Minutes to wait before killing a stalled backup to a non-tape device** field.



# Backup Retention Policy

The backup retention policy (also referred to as the **overwrite policy**) determines whether or not a new backup should be allowed to write over (thereby destroying) a current backup. A current backup is defined as one with a label currently on record. The default policy regarding TSM backups is to keep all backups on file unless explicitly expired (and removed) by the user. The default policy for **tape backups** is to prevent accidental overwriting by requiring the user to manually **expire** a current backup before the same tape may be reused.

This option allows you to define the **global** backup retention policy. This will apply to all backup jobs unless you explicitly change the backup retention policy for a particular backup job. Refer to the [Backup Retention Policy](#) in the [Backup Profile](#) settings for more information on overriding the global backup retention policy.

To change the global backup retention policy, select **File→Preferences→Backup Retention Policies** from the menu bar. The following screen will appear:

Select the action to take when a backup job is started:

**Tape Backups**

☒ Never automatically expire or overwrite a backup tape. User must manually expire all tape backups.

☐ Automatically expire and OVERWRITE a prior tape backup that is at least:  days or older. (0=always expire)

**TSM Backup Retention**

☒ Never automatically expire and REMOVE prior backups of the same job.

☐ Automatically expire and REMOVE prior backups of the same job that are:  days or older. (0=always expire)

**All Backups**

☐ Always retain a minimum number of:  backups of the same job before automatically expiring.

Save Cancel

## Tape Backups

Before any backup is performed to tape, the backup label is read. If a prior backup exists, a check is made to see if the backup label is still on file. If so, the setting applied here will determine the action that will be taken:

1. ***Never automatically expire or overwrite a backup tape. User must manually expire all tape backups.***

Select this option if no data will be written to the tape and the backup will fail with an error message. In order to overwrite the backup, the user must expire the backup manually. Refer to [Expiring a Backup](#) for the steps to expire a backup.

2. ***Automatically expire and OVERWRITE a prior tape backup that is at least: \_\_ days or older.***

Select this option if the backup will proceed **ONLY** if the backup to be overwritten is at least the specified number of days old. You can **always allow expiration and overwriting of a prior backup tape** by setting this value to 0. If the backup currently on the tape is less than the specified number of days, the backup will not be overwritten and the user will be required to expire the backup manually before proceeding. Refer to [Expiring a Backup](#) for the steps to manually expire a backup.



These global retention policies may be overridden for specific jobs by changing the [Retain](#) option in the backup profile.

## TSM Backups

Backups written to TSM servers are never overwritten by a new backup since each backup has a different object name (constructed using the backup Label ID, job ID, etc). A new copy of a backup will be written to the server each time a job is re-run. This option is used to free space on the server by automatically removing old backups when new backups are started. Two options are available for backups to disk (directories):

### 1. *Never automatically expire or remove prior backups of the same job.*

Select this option if no backups should ever be automatically expired when writing new backups. This will require that the user manually expire and remove each prior backup that is no longer needed. The user must take the steps to expire the older backups; else they will remain on the server indefinitely, using storage space which may be needed by newer backups. Refer to [Expiring a Backup](#) for the steps to manually expire a backup.

### 2. *Automatically expire and REMOVE prior backups of the same job that are \_\_\_\_ days or older.*

By selecting this option, older backups of the same job that is being run will be automatically expired and removed from the server if they are over the specified number of days. If no backups are needed for more than 90 days, selecting this option will ensure that backups over 90 days old are removed and replaced by a newer backup created using the same backup job.

If you enter "0" in this field, you are indicating that ***all prior backups of the same job will be removed and expired*** before the new backup is created.

## Number of Backups to Retain

In addition to, or in replacement of, the number of days that a backup must be retained, you may also specify the number of backups that must be retained for each job. To do so, select the checkbox next to the label ***Always retain a minimum number of \_\_\_\_ backups of the same job before automatically expiring***, and enter a number in the corresponding field.

By entering a number in this field, you will ensure that a minimum number of backups are retained for each job before a prior backup may be automatically expired. If, however, you set your retention policy to never allow a backup to be automatically expired, this entry will have no affect.

If you have set the retention options to always expire backups, then this setting alone will ensure that you always retain a minimum number of backups of each job, regardless of how old they are.



These global retention policies may be overridden for specific jobs by changing the [Retain](#) option in the backup profile.

Press the **Save** button to save your selections and close this window, or press the **Cancel** button to cancel changes.

## Backup Status Notifications

Because scheduled backups may be running even when the [SBAdmin Interface](#) is not running, it is necessary to provide a method by which the system administrator is informed of the status of backups. These status messages include indications of when backup jobs are started and completed, as well as any errors or warning messages that occur prior to, during, or after the completion of a backup. The messages will also include notifications of the automatic expiration and overwriting of prior backups (as determined by the [Backup Retention Policy](#)).

By default, the messages will appear only on the screen, if available, and if the screen is not available ([SBAdmin](#) is not running), the messages will be sent to the *root user's* mail. This option will allow you to change the default method of notification.

To change the settings, select **File→Preferences→Backup Status Notifications** on the menu bar. The following screen will appear:

The screenshot shows a dialog box titled "Backup Status Notifications". It is divided into two main sections: "Primary Notification" and "Alternate Notification".

**Primary Notification** section contains four radio button options:

- ☐ Show on screen if Administrator is running, else send to alternate notification
- ☒ Show on screen if Administrator is running, and also send to alternate notification
- ☐ Do not show on screen, always use alternate notification
- ☐ Do not show on screen, don't use alternate notification (may still view Job Status Log manually)

**Alternate Notification** section contains four options:

- ☒ Mail to user: [text field with "xxxx@storix.com"]
- Messages to mail: [dropdown menu with "Warnings and errors"]
- ☐ Append to file: [text field with "/tmp/backup\_status"]
- Messages to append: [dropdown menu with "All messages"]
- ☐ Use "Mail to user" and "Append to file"

At the bottom of the dialog are two buttons: "Save" and "Cancel" (represented by a red X icon).

## Primary Notification

One of the options in this section must be selected to determine where backup status messages should be reported:

1. ***Show on Screen if Administrator is running, else send to alternate notification.***

If this option is used, messages will be reported on the screen if the "*sbadmin*" program is running. If not, the messages will be reported using the [alternate notification](#) method indicated in the next section.

2. ***Show on screen if Administrator is running, and also send to alternate notification***

If you want messages always reported on the screen (when *SBAdmin* is running) and also sent using the [alternate notification](#) method, select this option.

3. ***Do not show on screen, always use alternate notification***

Select this if you do not want messages reported on the screen. In this case they will always be reported using the [alternate notification](#) method. Selecting this option is equivalent to using the first option when the *SBAdmin* is not running.

4. ***Do not show on screen, do not use alternate notification***

If selected, the messages will not pop-up on the screen and will not be sent to the [alternate notification](#). The messages are still logged for displaying on the screen at a later time. You will be asked if you want to display the messages whenever *SBAdmin* is started, when it is exited (in which case the log is cleared), and you may also press the **View Log** button on the [main screen](#) to display the log at any time.

## Alternate Notification

In this section, you will select how backup status messages should be handled when the alternate notification method is used. The alternate notification method will be used any time [SBAdmin](#) is not running

(cannot be displayed on the screen) and/or when the second or third options of the [Primary Notification](#) are selected.

## 1. Mail to user

By default, messages will be sent to the *root* user's mail when the alternate notification is used. If you want a different user to receive the mail messages, select this option, then enter the user id in the corresponding entry box. The user ID entered may be a local user (i.e. "mary") or a user on another host (i.e. "scooter@adminsyst"). You may want to limit the types of messages that are emailed to the user. To do so, select the arrow-button next to the Messages to mail field, and select either **All messages, Warnings and errors** or **Errors only**. A description of which messages fall under each category is shown below.

## 2. Append to file

Rather than sending mail, you want messages to be appended to a text file on the *admin* system, select this option, and enter the name of the file in the corresponding entry box. If the file does not already exist, it will be created when the first message is written. If it already exists, messages will be appended to the bottom of the file. Messages in this file will look similar to the following:

```
SBA JOBSTART: 000003
June 17 16:50:04 PDT 1999
Job 000003 has been started.
  Backup Device: TSM
  Backup Server: spiderman
  Job Clients:   mickey minnie goofy
-----
SBA JOBERR: 000003
June 17 16:53:44 PDT 1999
Job 000003 cannot be written to the tape.
  Backup Device: TSM
  Backup Server: spiderman
  Job clients:   mickey minnie goofy
  Error Message: The tape currently in the drive contains a current
backup label (929523610). The overwrite policy does not allow overwriting of
this backup. Please either expire this backup or change the overwrite policy
to allow overwriting of current backups.
-----
SBA JOBSTART: 000003
June 17 16:58:21 PDT 1999
Job 000003 has been started.
  Backup Device: TSM
  Backup Server: spiderman
  Job Clients:   mickey minnie goofy
-----
SBA JOBOK: 000003
June 17 17:45:12 PDT 1999
Job 000003 completed successfully.
  Backup Device: TSM
  Backup Server: spiderman
  Job Clients:   mickey minnie goofy
  Backup ID: 929665124
```

For easier identification of important messages, all messages in this file contain a header indicating the message type. These include:

<b>TAG</b>	<b>MSG TYPE</b>	<b>DESCRIPTION</b>
<b>ERROR</b>	error	general error (error message)
<b>INFO</b>	note	general info (all messages)
<b>VOLCHG</b>	warning	tape volume change requested (all messages)
<b>JOBSTART</b>	note	a job has started (all messages)
<b>JOBOK</b>	note	a job completed successfully

<b>JOBWARN</b>	warning	a job completed successfully with a warning message
<b>JOBERR</b>	error	a job terminated with an error

If you set the Messages to append value to **"All messages"**, then you will see all messages in the file.  
If you set it to **"Errors and warnings"**, then all "note" messages will be omitted. Likewise, if you set it to **"Errors only"**, then only the messages of type "error" will be shown.

The message types indicated above (i.e. "JOBERR") will also appear in the subject line of mail messages if mail is used as the alternate notification method.

# 21. Reports

When you select [Reports](#) from the menu bar, you may further select from a list of reports that may be viewed and/or printed. Refer to [Report Preferences](#) for information on configuring printers, files and email addresses for reporting. Each time a report option is selected, a screen similar to the following will be presented:

The above example is used when printing a “**Backup Job History**” report. The option at the top, **Print/Send to**, and the **Print/Send** and **Preview** buttons at the bottom of the screen are provided for all report options. The other options will vary for each report option selected.

You may select the **Print/Send** button to generate the report and send it directly to the specified printer, file or email address. You may use the **Preview** button to generate the report in a window such as the following example (**Backup Job History** report):

woody	weekly_woo	06/01/12	01:00	1338537608	100/0	1-1	44	25508	9710
woody	weekly_woo	06/08/12	01:00	1339142405	100/0	1-1	43	25781	10103
woody	weekly_woo	06/15/12	01:00	1339747206	100/0	1-1	46	25804	9525
woody	weekly_woo	06/22/12	01:00	1340352007	100/0	1-1	46	26007	9583
Subtotal (averages) for client woody:							48	26828	14936
Total (averages) for job weekly_woody:							48	26828	14936
Client	Job ID	Date	Time	BackupID	%Comp/EC	Vols	Mins	MB	KB/sec
woody	woody_offs	04/11/11	08:13	1302534804	0/99	1-1	1	600	5442
woody	woody_offs	04/11/11	11:17	1302545827	100/0	1-1	48	25219	8951
woody	woody_offs	04/18/11	07:54	1303138444	100/0	1-1	64	25292	6697
woody	woody_offs	04/25/11	07:25	1303741529	100/0	1-1	49	25366	8666
woody	woody_offs	05/23/11	15:42	1306190556	100/0	1-1	48	25505	8916
woody	woody_offs	05/24/11	11:42	1306262532	100/0	1-1	51	25505	8452
woody	woody_offs	05/31/11	16:08	1306883339	100/0	1-1	78	25524	5579
woody	woody_offs	06/07/11	07:09	1307455764	100/0	1-1	49	25524	8877
woody	woody_offs	06/13/11	07:32	1307975551	100/0	1-1	49	25523	8841
woody	woody_offs	06/20/11	07:34	1308580453	100/0	1-1	67	26085	6576
woody	woody_offs	06/27/11	07:54	1309186489	0/99	1-1	0	65	4437

From the **Preview** window you may scroll up and down the report, then print or send the report by selecting the **Print/Send** button, or you may also edit the contents of the report in order to add your own comments. To edit the report, select the **Edit** button. The color of the text will change and you will be allowed to click-on and make changes to the text. The **Edit** button will change to **Save** which, when pressed, will save the changes and disable the editor.

In the remainder of this section, a brief description of each report option is provided.

# Backup Profiles

Select [Reports→Backup Profiles](#) to print a list of the profiles configured on the system. Refer to the main [Reports](#) section above for details on the [Print](#) and [Preview](#) options. When selecting this option, an additional option is provided:

- **Include customized job profiles:** Check this box if you want to print a list of the profiles that have been customized for particular jobs. If not checked, only the original job profiles will be included.

# Exclude Lists

Select [Reports→Exclude Lists](#) to display or print a list of configured exclude lists. Refer to the main [Reports](#) section above for details on the [Print](#) and [Preview](#) options. When selecting this option, no additional options are provided. The list will contain each exclude list name, along with a list of files, directories and devices which are excluded, and the list of clients (or “all”) that the exclude list applies to.

# Backup Jobs

Select [Reports→Backup Jobs](#) to print a list of the backup jobs configured on the system. Refer to the main [Reports](#) section above for details on the [Print](#) and [Preview](#) options. When selecting this option, no additional options are provided. The list will contain all jobs in the system, whether set to run once, regularly or on-demand. If set to run at a certain time or times, the schedule will be included in the report.

# Backup History

To print a Backup History Report showing the dates, times and backup statistics for each client backup, select [Reports→Backup History](#) from the main menu bar. A further option is provided for running the report in the order of client or job ID.

**Running the report by client:** Select [Reports→Backup History→By Client](#). You may select one or more clients for which to print the report or, by not specifying any clients, the report will be reported for all clients. The report may be printed even for clients that are no longer configured by manually typing the client name in the entry box. You may optionally select to print subtotals by Job ID, detailing the average megabytes, number of minutes, and Kbytes per second for each job under which the client has been backed up. These averages will also be shown for each client in the list.

**Running the report by Job ID:** Select [Reports→Backup History→By Job ID](#). You may select one or more Job IDs for which to print the report or, by not specifying any job IDs, the report will be reported for all Job IDs. The report may be printed even for jobs no longer configured by manually typing the job ID in the entry box. You may optionally select to print subtotals by client, detailing the average megabytes, number of minutes, and Kbytes per second for each client within the job. These averages will also be shown for each job in the list.

You may also select starting and ending dates for this report. If provided, the report will only include backups that occurred within that date range.

# Restore History

To print a Restore History Report showing details regarding the restore, select [Reports→Restore History](#) from the main menu bar. A further option is provided for running the report in the order of job or backup ID.



Restore history was introduced in SBAdmin v8.1. Therefore, only restores performed with SBAdmin v8.1 will be reported.

**Running the report by Job ID:** Select [Reports→Restore History→By Job ID](#). You may select one or more Job IDs for which to print the report or, by not specifying any job IDs, the report will be reported for all job IDs.

**Running the report by Backup ID:** Select [Reports→Restore History→By Backup ID](#). You may select one or more Backup IDs for which to print the report or, by not specifying any backup IDs, the report will be reported for all backup IDs.

You may also select starting and ending dates for this report. If provided, the report will only include restores that occurred within that date range.

## Backup Expiration Report

To print a report showing the backup labels past their expiration dates, select [Reports→Backup Expiration Report](#) from the main menu bar. You will have the option of showing all backups, even if they are not past their expiration date, backups past their expiration dates as of today's date, or backups that will be past their expiration date as of a specified date.

This resulting report will tell you what backups are past their expiration date and may be expired. Of course, any backup may be expired manually (See [expiring a backup](#)), and if your [overwrite policy](#) is set to allow any overwriting of backups and you did not specify a , then the backups will always be expired when they are overwritten.

A backup will be shown on this report if any of the following are true:

1. You are listing all backups, regardless of their expiration date.
2. There is no [backup retention period](#) specified in the job settings.
3. The retention period in the job settings (number of days) has passed since the backup was performed.
4. You specify a reporting date in the future at which time the backup will have expired.

Note that the changing the backup retention period for a job will not change the retention period of backups that have already been performed.

## Network Install Clients

Select [Reports→Network Install Clients](#) to print a list of the clients that have been configured for network installation. Refer to the main [Reports](#) section above for details on the [Print](#) and [Preview](#) options. The report will contain all information pertaining to the *network boot* and *network installation* for each client. The process will also attempt to determine if the client is currently configured for network boot on the server system, and will include an appropriate message (client is ready to boot, *boot server* is unavailable, or client is not configured on the boot server). When selecting this option, an additional option is provided:

**Include only clients currently ready for network boot:** Check this box if you want the list to include only those clients that are currently ready to be network booted from a boot server. If the boot server cannot be contacted to determine the status of the network boot configuration, the client information will be listed regardless.

After a client is configured for network boot (see **Network Boot/Install Configuration** in the **SBAdmin System Recovery Guide**), the boot configuration is updated on the boot server. If the network boot is disabled, the client network boot and install configuration is removed from the boot server but retained on the admin system for future use. If not checked, the list will include all network install client configurations, whether the client is currently ready for booting or not. If checked, the boot server assigned to the client will be checked to see if the client is currently configured for booting, and the client configuration will not be listed only if configured on the boot server.



## 22. Utilities

This section provides instruction on the use of the utilities that are not typically used on a day-to-day basis but provide useful features or the ability to tailor the behavior of the application.

### Create/Manage Boot Media

System Installation media is bootable media which may be used to boot the system to the **SBAAdmin System Installation** process. To create boot media, select the following:

[Utilities→Creat/Manage Boot Media](#)



The **SBAAdmin System Recovery Guide** provides detailed instructions on using this option to create boot media. The instructions here provide for boot media options that are available only with *TSM Edition*, since other administrator licenses use local and remote disk and tape backup media also.

Two options are available for creating system boot media when using *TSM Edition*:

- **CDROM image** – A CDROM image is an *ISO9660 format filesystem image*, which may be burned to a CD writer using any number of third party applications. For most Linux systems, you can use the “**cdrecord**” command, on Solaris use the “**cdrw**” command, and on AIX systems you can use the “**cdwrite**” command. These software applications must be installed separately (not provided by SBAAdmin), and you must refer to the instructions with the individual application for detailed instructions.
- **Network** – Network boot images allow a client system to be booted over the network from a **Boot Media Server**. This option will create the images and copy them to the boot media server. You can create a single boot image for compatible systems (i.e. same OS release and hardware type), or a separate boot image for each client. A separate option is used to **Enable a Client for Network Boot**, which is described in the **SBAAdmin System Recovery Guide**.



For *Linux*, the network boot images are created and copied to the boot server, but some *bootloader* configuration must be manually performed by the user. This is automated on *AIX* and *Solaris* systems, but is more difficult for *Linux* due to the number of different boot loaders and configuration file formats that are available.

Creation of each of these media types is described in more detail in the respective sections of the Recovery Guide for each operating system. Refer to the **SBAAdmin System Recovery Guide** for details.

### Remote Installation Manager (RIM)

After a client system is booted from the *SBAAdmin System Installation Media*, the installation process may be performed remotely from any compatible “**ssh**” client program. SBAAdmin includes an *ssh client* for this purpose, allowing you to display, manage and perform the system installation of the client directly from the SBAAdmin Interface.

Before you can access the installation process on the client, the client must have started RIM, providing password required to log on. RIM and the associated password may have been setup and started within the client installation menus after booting from the media, or may have been configured when the boot media was created.



Only a user on a remote system (including this admin system) using a compatible *ssh client* program and the previously configured password can access the client's installation process.

Once the client has enabled access, select the menu option [Utilities→Start Remote Installation Manager](#). You will be asked for the client IP address and password. A new window will be displayed with the **System Installation Menus**. You may then change the settings or perform the installation for the client.

Details of the configuring and enabling *Remote Install Manager* access is described in detail in the **[SBAdmin System Recovery Guide](#)**.

## Write a Tape Label ID to a Tape

A **Tape Label ID** is a unique identifier for each tape that is used with SBAdmin. Tape labels are not required in order to use a tape for a backup, but having a tape label will make it easier to determine the contents of a tape and track which tapes belong together in a set.

For SBAdmin to track the contents by tape labels, the tape label id must be physically written to the tape before it is used for any backups. A physical adhesive tape label often comes with tapes that contain a unique tape identifier. You may use this tape id, if any, or you may create your own id. Tape IDs may contain up to 16 characters, but may not include colons (:) or spaces.

To write a tape label id to a tape, select [Utilities→Write a Tape Label ID to a Tape](#). A screen similar to the following will appear:

Server Name: woody  
Device Name: st0  
Tape Label ID (16 chars max) myTapeLabelID01  
Write Tape Label

You must press the arrow keys next to each entry field to list and select **Client Name** and the **Device Name** in which the tape is inserted. Next, type the tape label id in the **Tape Label ID** field. When all entries have been made, press the **Write Tape Label** button.

First, the tape will be read to ensure that there is not already a current backup on the media. Because this process will write a new label, overwriting any previous backup contents, you may not overwrite a current backup. If a current backup is found on the tape, you will be given the option of automatically expiring this backup and overwriting the tape contents with the new tape label.

The process will then write the tape label to the tape, which usually takes only a few seconds. A message will appear when the process is complete.



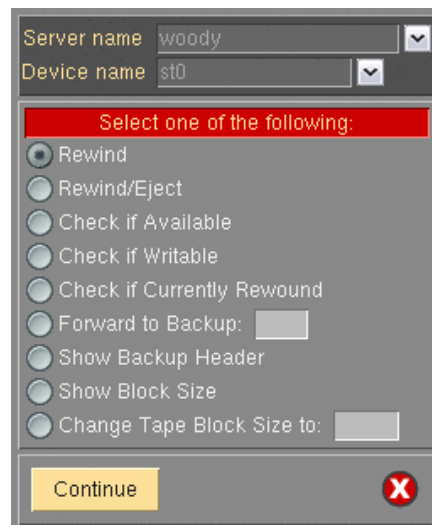
Once a tape label ID has been written to a tape, it should never again be necessary to use this option again for the same tape, as the tape label id is always reused, even when overwriting a previous backup with a new backup.

If you ever need to read the tape label ID from the tape, you can use the option [Perform a Tape Operation](#) and select the **Read Backup Header** option. The tape label ID, as well as other backup information, if any, will be displayed on the screen.

Once a backup has been written onto a tape that has a tape label, the [Backup Label](#) will show the tape label IDs of each tape volume that makes up the entire backup.

# Perform Tape Operations

This option provides a number of useful features for performing tape operations, such as rewinding, ejecting, checking and reading information from a tape. To use these options, select [Utilities→Perform a Tape Operation](#) from the main menu bar. When doing so, a screen similar to the following will display:



You must press the arrow keys next to each entry field to list and select the **Client Name** and the **Device Name** in which the tape is inserted. To perform an operation, press the radio button next to the desired option and press the Continue button at the bottom of the screen. Each option is described below:

1. **Rewind:** Rewinds the tape in the device
2. **Rewind/Eject:** Rewinds, then ejects the tape from the device.
3. **Check if Available:** Displays a message indicating whether or not the device is available and a tape is inserted.
4. **Check if Writable:** Displays a message indicating whether or not the device is available, a tape is inserted and whether or not the write-protect tab on the tape has been set.
5. **Check if Currently Rewound:** Displays a message indicating whether or not the tape is currently rewound, or at beginning of media.
6. **Forward to Backup:** To use this option, you must also enter a [backup sequence number](#) in the field to the right, or you may enter the word “end” to forward to the end of the backup. You may insert any volume of the backup prior to or including the start of the backup you are forwarding to (or the last tape volume if forwarding to the end). After forwarding to the end of the last backup on the media, may append additional backups to the same tape and backup label.
7. **Show Backup Header:** Reads the backup header on the tape and displays the header information, which includes the backup id, [tape label](#) (if any), backup date, volume number, client, job id, backup type, etc. Note that this differs from showing the backup label since the output of this option pertains only to this tape. Included in the display will be information showing the current position of the tape within the backup.
8. **Show Block Size:** Displays the current physical block size setting for the tape drive. For SBAdmin backups, the tape block size will always be changed to 0 (variable) before a backup is performed, and it will remain set to 0 after the backup completes, since the block size must be set the same during a restore as it was during the backup.
9. **Change Tape Block Size to:** You must enter a block size in the field to the right when using this option. SBAdmin backups are always performed using a variable (0) physical block size setting. If the tape drive

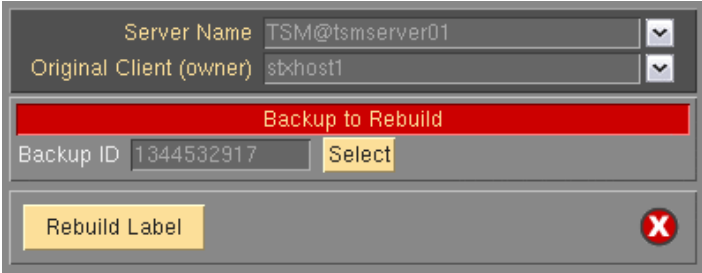
block size was set to any other value by another application or when the drive was reconfigured, you will need to set the block size to 0 again before you can read an SBAdmin backup.

## Rebuild (unexpire) a Backup Label

Normally, when a TSM backup is expired within SBAdmin, the backup is actually removed from the *TSM server*. In this case, the backup is no longer accessible. For backups to **tape**, however, the backup label information still exists on the tape itself, even if a backup label has been expired and removed, and can therefore be recovered.

As stated in the many warnings you received when you pushed that "expire" button, it is not possible to restore from a backup once the label has been removed. Should you find a SBAdmin tape backup that not known to this administrator; this option will read through the contents of the tape and rebuild the label. Once that is accomplished, you may restore from the backup normally.

To rebuild the backup label, select **Utilities→Rebuild (unexpire) a Backup Label** from the menu bar. A screen similar to the following will appear:

The screenshot shows a dialog box titled "Rebuild (unexpire) a Backup Label". At the top, there are two fields: "Server Name" with the value "TSM@tsmsserver01" and "Original Client (owner)" with the value "stxhost1". Below these is a red header bar with the text "Backup to Rebuild". Under the header bar, there is a "Backup ID" field containing "1344532917" and a "Select" button. At the bottom of the dialog, there is a "Rebuild Label" button and a red "X" icon in a circle.

Use the arrow button to select the **Client name** from the drop-down list. After doing so, you must select the **Device Name** in the next field. You can also choose "local (client tape)" for the **Server**. By selecting this option, you indicate that you want to read the backup information from a tape drive attached to a client system (SBTAPE), rather than the TSM server. After doing so, a new **Client Name** field will appear, where you must select the client where the tape drive is attached.

Press the **Select** button next to the **Backup ID** field to list and select from backups that exist on the tape. Note that the list will contain **yellow** and **green** buttons, yellow indicating those backups for which there is no backup label currently. You can only select one of these backups when you want to rebuild a label.

Once you have selected the backup, press the **Rebuild Label** button to begin reading the backup and rebuilding the backup label. As this occurs, a screen similar to the following will appear:

The screenshot shows a status window with a dark header bar. The header bar contains "Server: TSM@tsmsserver01" and "Device: API". Below the header bar, the text "Rebuilding backup label from tape." is displayed. Underneath, the word "STATUS:" is shown. The main area of the window contains the text "The rebuild of the backup label is complete." and "The new backup label ID is 1344532917." At the bottom of the window, there are two buttons: "Done" and "Show Label".

When the process is complete, the completion status will be displayed and a **Show Label** button will appear, with which you can display the [Backup Label](#) or press the **Cancel** button to return.

# 23. Network Security

SBAAdmin was created with safeguards in place to prevent breaches in security without disrupting the security and integrity of the remaining network. This section outlines the flow of network traffic, the security measures that have been implemented, and what steps need to be taken by security personnel to insure that your software will function properly between network firewalls.

## TCP/IP Ports

SBAAdmin configured with a *TSM Edition* license communicates via the **Transmission Control Protocol/Internet Protocol (TCP/IP)**. This communication is handled through two different ports, the **Dataport** and the **Statusport**. By default, the SBAAdmin uses port numbers 5026 and 5027 which are registered with the **Internet Assigned Numbers Authority** (previously used 8191 and 8192). These ports numbers are determined during the installation of the software and can be changed by the user at that time. If you need to change the port numbers used, simply reinstall the software and update the port numbers at that time. If you change your port numbers, previously made boot images on CDs will attempt to communicate through the old port numbers if installing from a remote server. It is advised to create your boot media/images after changing your port numbers.



It is very important that the **Administrator** and **Clients** using SBAAdmin are configured to use the same port numbers. You can verify this by checking in the `./stdefaults` file for the following entries:

```
DATAPORT=5026
STATPORT=5027
```

These two ports are *listening ports* and must be open to incoming TCP/IP traffic from other systems within your SBAAdmin network. SBAAdmin uses the ports specified above to transfer backup data, status messages, and to run remote commands. Only the SBAAdmin network daemon process “**strexecd**” can properly answer requests on these ports. Any other process attempting to open these ports will receive a connection error.

## Network Firewalls

When a backup or restore is performed remotely, commands are initiated between the *Admin* and *Client*. The network communications on these ports are setup automatically when SBAAdmin is installed on any system. If you have a network firewall between any of your systems utilizing SBAAdmin, you will need to open the communication on these ports, or select other port numbers to use that are allowed by the firewall.

Some firewalls will close inactive ports after a certain period of time. It is advisable to turn off this timeout, if possible. Should a firewall timeout occur, SBAAdmin will continue a backup, but no further messages will appear and SBAAdmin will not receive the exit status of the command. Although the backup usually completes successfully, SBAAdmin will appear to have hung.

## Remote Command Execution

SBAAdmin is the only application that can communicate over the SBAAdmin ports. In addition, only specific commands can be run remotely.

All remote commands are executed using the “**strexec**” executable, which may be executed only by the root user on the system.

All attempts to run remote commands are checked for authenticity as follows:



In the following, **\$STXPATH** designates your SBAAdmin data directory chosen when installing the software (default is /storix), and **\$STXINSTPATH** is the SBAAdmin application directory (/opt/storix for Linux & Solaris or /usr/lpp/storix for AIX).

1. The IP address of the sender is checked to see if it is a valid *admin system*. Valid admin systems are specified in the **\$STXPATH/config/admin\_servers** file when SBAAdmin is installed onto a client system. If the caller is an administrator system, no further hostname or IP address checking is performed.
2. The *groupid* of the caller is checked that it is a member of the same group. The group of a client is identified by the **\$STXPATH/config/group** file. This file is created by the SBAAdmin administrator system and copied to each client when it is configured.
3. The IP address of the sender is checked to see if it is a valid client (if calling a server). The **\$STXPATH/config/serveraccess\_groupid** file determines the permitted hosts. This file is created by the SBAAdmin administrator system and copied to each server when clients are added or removed from the server's group.
4. The command to execute is checked to ensure it is not a wrapper. For instance, no commands containing sub-commands such as "command1; command2" or "command1 \$(command2)" may be executed.
5. The command to execute is checked to ensure it does not contain an absolute pathname. Only the command name to execute must exist on the system in the **\$STXINSTPATH/bin** directory.
6. The command to execute is checked to see if it a permitted remote command. Permitted commands are listed in the **\$STXINSTPATH/config/remote\_cmds** file. Programs listed here may not have a leading PATH, but the commands themselves must exist in the **\$STXINSTPATH/bin** directory.
7. For user-customized pre and post-backup commands, the commands must exist in the **\$STXPATH/custom** directory, must be writeable only by root and must be executable.

Note that all of the above configuration files and directories may only be written by the root user on the system.

## Remote Installation Manager

The **Remote Installation Manager (RIM)** provides a remote system anywhere on the network to connect to the system installation process of a client. This access is provided using a secure (**ssh**) connection. Since this access is only available when this option has been configured, a password has been set, and the client is booted to the system installation process. There is little security risk, but it is worth noting that the remote user will have access to all system installation process options and installation media available to the client system.

RIM access is only provided after booting from SBAAdmin system installation boot media and either:

- a. enabling RIM access within the system installation menus from the client
- or
- b. pre-configuring automatic enabling of RIM access when the installation media is configured.

In either case, a password is selected that the remote ssh program must use to connect to the client's installation process.

# Encryption Keys

This section is applicable only if the ***Backup Encryption Optional Feature*** is installed.

Encryption keys are entered on the client system using the **stkeys** command. This prevents the encryption keys from being passed across the network in any form. The encryption keys are stored in a file on the client system, unreadable by any user other than “root”, and neither the file nor the information therein is ever sent over the network.

# 24. Getting Help

## QuickHelp

If you are uncertain of the use of a particular button, listbox or entry field, you may at any time move the cursor over the object in question and press the right mouse button. A popup message will appear on top of the object with information on its use and any options, warnings or special instructions that might apply. Information is provided for every selectable object in the application. After reading the message provided, you may click any mouse button anywhere on the screen to remove the QuickHelp message and continue as usual.

Always use the QuickHelp as your first step in understanding or resolving a problem!

## User Guide

This user guide may be displayed at any time from the *Backup Administrator* user interface by selecting [Help→User Guide](#) from the menu bar. This user guide contains links so that clicking on any underlined text will move you immediately to the referenced section of the text.

When selecting this option, a PDF viewer application will be started in order to open the user guide file, which is in *Portable Document Format* (PDF format). The viewer provided with this application is a simple viewer to save space, and does not provide all the functions of some larger PDF viewers. If you prefer to use another PDF viewer, simply set the VIEWER environment variable to the name of the viewer application file before starting the *SBAAdmin*. If the specified program exists, the user guide will be opened using this program.

## Communications Errors

A tool is available to help diagnose problems in communicating between the TSM *Admin system* and clients. If the client icon on the [Main Screen](#) shows a red symbol (indicating the client is unavailable), or if an error occurs such as "Client host may not be contacted", run the **stcheck** command to help determine the cause. Refer to the **stcheck** command in the [Commands Reference Guide](#) for details.

## Storix Support

Should you encounter a problem using **SBAAdmin** or have any questions, numerous support options are available. Select [Help→Storix Support](#) from the menubar to display current information on support options available to you. This will provide you with links to obtaining online and telephone support, hints and tips, etc.



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